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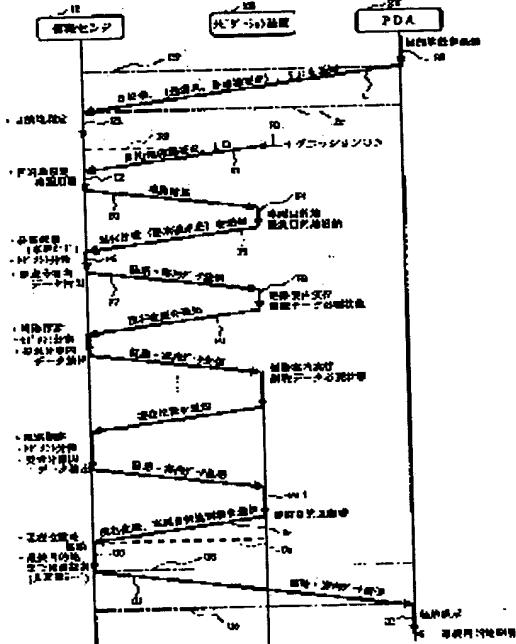
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(54) NAVIGATION DEVICE, INFORMATION CENTER, GUIDANCE SYSTEM, AND ROUTE TRANSMITTER

(57)Abstract:

PROBLEM TO BE SOLVED: To make acquirable specific data such as destination, running route immediately by ignition-on.

SOLUTION: A user previously registers the destination set by a PDA in an information center before departure. And, when the user gets on a vehicle and turns on the ignition, the navigation device confirms whether the destination is set in the information center or not. In the information center, when the destination of the vehicle with corresponding ID is set, the route from the present location to be transmitted from the navigation device to the set destination of the vehicle is searched and the recommended running route is transmitted. Since the running route to the destination which is preset by the PDA, etc., is acquired from the information center immediately after the ignition-on, the user does not have to perform a series of operations from power application of the navigation device to setting and transmission of the destination in the vehicle.



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CLAIMS

[Claim(s)]

[Claim 1] A detection means to detect ignition-on of a car, and a check means to check the existence of the setting information set as the information centre in advance when ignition-on is detected by this detection means, Navigation equipment characterized by providing a receiving means to receive the specific data transmitted from said information centre based on the check of this check means, and a specific processing means to perform specific processing based on the specific data received with this receiving means.

[Claim 2] A detection means to detect ignition-on of a car, and a check means to check the existence of the setting information registered into the information centre by self when ignition-on is detected by this detection means, Navigation equipment carried out [providing an acquisition means to acquire the setting information concerned from said information centre, and a specific processing means to perform specific processing based on the setting information acquired with this acquisition means, when / that there is setting information registered into self by this check means / a thing check is carried out, and] as the description.

[Claim 3] It is navigation equipment according to claim 2 characterized by for the setting information registered into said addressing to self being the destination information for setting up the destination, and said specific processing means performing the transit path planning to the destination set up using the destination information acquired with said acquisition means, or guidance of a transit path for which it looked as said specific processing.

[Claim 4] It is navigation equipment according to claim 2 characterized by for the setting information registered into said addressing to self being the guidance information on a transit path, and said specific processing means performing guidance based on the guidance information on the transit path acquired with said acquisition means as said specific processing.

[Claim 5] Said setting information is claim 1 characterized by being the setting information transmitted from information processors, such as a Personal Digital Assistant, a personal computer, and navigation equipment, claim 2, and navigation equipment according to claim 3 or 4.

[Claim 6] Navigation equipment given in any 1 claim of claim 1 to the claims 5 characterized by providing an arrival decision means to judge whether the car arrived at the destination, and a destination arrival transmitting means to transmit destination arrival and the car current position at said information centre when it is judged that it arrived at the destination with this arrival decision means.

[Claim 7] Said attainment decision means is navigation equipment according to claim 6 characterized by judging that it arrived at the destination when the car current position was in agreement with said destination, or when the distance of the car current position and said destination became below fixed distance.

[Claim 8] Navigation equipment indicated to any 1 claim of claim 1 to the claims 7 characterized by transmitting the car current position to a Personal Digital Assistant when a car arrives at the car destination and said information centre and communication link cannot be performed at the car destination concerned.

[Claim 9] A setting information receiving means to receive the setting information transmitted from information processors, such as a Personal Digital Assistant, a personal computer, and navigation equipment, A setting information storing means to store the setting information addressed to the specific phase hand who received with this setting information receiving means, From the navigation equipment indicated to any 1 claim of said claim 1 to the claims 7 Based on the acknowledge request of the existence of the setting information registered into self, with a check means to check whether setting information is stored in said setting information storing means, and this check means The information centre characterized by providing a transmitting means to transmit said setting information to said navigation equipment when it is checked that the setting information addressed to said navigation equipment which carried out said acknowledge request is stored.

[Claim 10] The storing field and said navigation equipment of said setting information in said information processor and a setting information storing means are matched by ID for every user. Said setting information storing means The information centre according to claim 9 characterized by storing in the storing field of said setting information storing means corresponding to ID of other users of whom said received setting information was required when the receiving contents of said setting information receiving means include the setting demand to other users.

[Claim 11] Said setting information is an information centre according to claim 9 or 10 characterized by being the destination information for setting up the destination.

[Claim 12] the case where said received setting information is stored in the storing field of said setting information storing means corresponding to other users' demanded ID with said setting information storing means — being concerned — others — the information centre according to claim 10 characterized by providing a notice means to

tell a user about that.

[Claim 13] The information centre according to claim 9 characterized by providing a notice means to notify the contents of the purport or setting information that registration of setting information was carried out, to said specific phase hand when the transmitting person and said specific phase hand of setting information differ from each other.

[Claim 14] Said notice means is an information centre according to claim 12 characterized by telling a user besides the above about that by the electronic mail, facsimile or data communication, and the voice communication by the voice data from which it synthesized voice.

[Claim 15] A car attainment decision means for the destination which said setting information receiving means receives the destination information for setting up the destination as said setting information, and is set up for this destination information to be able to reach by the car and to judge whether it is a point. When said destination is judged to be the point which cannot reach by the car with this car attainment decision means It has a car destination setting means to set up the point which can reach by the car around said destination as a car destination. Said transmitting means An information centre given in any 1 claim of claim 9 to the claims 14 characterized by transmitting the car destination information on said car destination to said navigation equipment.

[Claim 16] A destination information receiving means to receive the destination information transmitted from information processors, such as a Personal Digital Assistant, a personal computer, and navigation equipment, A car attainment decision means for the destination set up for the destination information received with this destination information receiving means to be able to reach by the car and to judge whether it is a point, A car destination setting means to set up the point which can reach by the car around said destination as a car destination when said destination is judged to be the point which cannot reach by the car with this car attainment decision means, A non-car moving trucking retrieval means to search for the moving trucking for arriving with non-car migration means other than a self-car from said car destination set up with this car destination setting means to said destination, The information centre characterized by providing a moving trucking transmitting means to transmit the information on the moving trucking for which it was searched with this non-car moving trucking retrieval means to a Personal Digital Assistant.

[Claim 17] It is the information centre according to claim 15 which is equipped with a destination arrival receiving means to receive the destination arrival information transmitted from navigation equipment, and the car current position, and is characterized by said moving trucking transmitting means transmitting said moving trucking to a Personal Digital Assistant when the car current position received with said destination arrival information receiving means is the car destination set up with said car destination setting means.

[Claim 18] Said non-car migration means is public cars, such as a taxi and a bus, a cable car, a monorail, a ropeway, an electric car, a train, a ship, a moving walk, and an information centre according to claim 15 characterized by being at least one of on foot.

[Claim 19] A car current position storing means to receive and store navigation equipment empty vehicle both the current positions, A Personal Digital Assistant location receiving means to receive the current position from a Personal Digital Assistant, A non-car moving trucking retrieval means to search for the moving trucking for arriving at said car current position stored in said car current position storing means from the current position received with this personal digital assistant location receiving means with non-car migration means other than a car, The information centre characterized by providing a moving trucking transmitting means to transmit the moving trucking for which it searched with this non-car moving trucking retrieval means to said Personal Digital Assistant.

[Claim 20] A detection means to detect ignition-on of a car, and a check means to check the existence of the setting information set as the information centre in advance when ignition-on is detected by this detection means, A receiving means to receive the specific data transmitted from said information centre based on the check of this check means, Navigation equipment equipped with a specific processing means to perform specific processing based on the specific data received with this receiving means, A setting information receiving means to receive the setting information transmitted from information processors, such as a Personal Digital Assistant, a personal computer, and said navigation equipment, A setting information storing means to store the setting information received with this setting information receiving means, A check means to check whether setting information is stored in said setting information storing means based on the acknowledge request from said navigation equipment, the information centre equipped with a specific data transmitting means to transmit specific data to said navigation equipment when storing of setting information was checked with this check means -- since -- the becoming guidance system.

[Claim 21] It is the guidance system according to claim 20 which said setting information is destination information and is characterized by said specific data being destination information or the guidance information on a transit path.

[Claim 22] The path sending set characterized by having a transmitting means to be the path sending set formed in the exterior of a Personal Digital Assistant, and to transmit the path from the car destination to the last destination to said Personal Digital Assistant before a car arrives at said car destination.

[Claim 23] The path sending set characterized by having a transmitting means to be the path sending set formed in the exterior of a Personal Digital Assistant, and to transmit the path from the car destination to the last destination to said Personal Digital Assistant when a car arrives at said car destination.

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DETAILED DESCRIPTION

[Detailed Description of the Invention]

[0001]

[Field of the Invention] This invention relates to the navigation equipment which performs guidance for reaching to the destination, an information centre, a guidance system, and a path sending set.

[0002]

[Description of the Prior Art] The navigation equipment to which it searches for the transit path to the destination, and shows an operator has spread widely. the transit path for which it searched while the destination was set up from the name of the telephone number or a facility, a genre, the address, etc. (destination setting processing), this navigation equipment was searched for the recommendation transit path from the car current position or an origin to the set-up destination (path planning processing) and the GPS receiving set etc. detected the current position — following — the path to the destination — voice and an image — showing around (path guidance processing) — it carries out.

[0003] On the other hand, recently, navigation equipment is equipped only with a minimum program and data, navigation equipment performs a setup and path guidance to the destination, and the communication link NABISHI stem which was made to perform by putting the path planning to the destination in block in an information centre is also developed. In this system, radio means, such as a land mobile radiotelephone, and a cellular phone, PHS (Personal Handy-phone System) which were connected to equipment, receive transmission to the information centre of the destination, the recommendation transit path for which the information centre was searched.

[0004]

[Problem(s) to be Solved by the Invention] However, with the above-mentioned conventional navigation equipment, when a destination setup was performed, remote control, a touch panel, etc. needed to be operated in the car. That is, the user who got on switched on the power source of navigation equipment, he had to set up the telephone number, the address, or a facility name by remote control, a touch panel, etc. as the destination or a course ground (shunt), referring to a menu, and the destination was not able to be immediately acquired after entrainment and he was not able to acquire the transit path to the destination. Therefore, with conventional navigation equipment, after taking the car, before receiving the path guidance to the destination, it had taken time amount. Moreover, also when two or more members ran to the same destination with each one of cars, each member needed to set up the destination according to the individual as a self destination, and needed to acquire the search path.

[0005] Then, this invention makes it the 1st purpose to enable it to acquire specific data, such as a destination and a transit path, immediately by ignition-on for the purpose of attaining such a technical problem. Moreover, let it be the 2nd purpose to enable it to set up setting information, such as a destination to other navigation equipments.

[0006] By the way, with navigation equipment, since a transit path and the current position are displayed on the display in a car or it is premised on guiding a transit path with outputting guidance voice by the loudspeaker in a car, it is the requisite for the destination to set up to be able to reach with a car. However, the destination at which a user is finally going to arrive may be a point which reaches with means other than cars, such as a walk and a cable car, (non-car means) not from the point (car destination) which can reach by the car but from the car destination. For example, to the last destination, if it does not pass along the exclusive pedestrian road which cannot perform passing of a car, it may be unable to reach. In this case, although the path to origin empty vehicle both destinations is set up, the path from the car destination to the walk destination is not set up. Moreover, also when there is no parking lot in the car destination (when the car destination and the walk destination are the same) and the parking lot around the destination is set up as a car destination, it differs from the car destination and the walk destination. When moving by walk etc. to such a destination, the Personal Digital Assistant which grasps the path to the walk destination by downloading and displaying the map from the current position to the destination on a Personal Digital Assistant (PDA) is proposed (JP,9-26968,A).

[0007] However, since both current position and destination are displayed in the case of such a Personal Digital Assistant, after being unable to set up the destination beforehand in any locations other than an origin but arriving at an origin (car destination), it is necessary to set up again the last destination set up before car transit, and to download map data. For this reason, immediately after arriving at the car destination, it was not able to move toward the last destination. Moreover, it needed to have the GPS receiving set for a Personal Digital Assistant to detect the location of confidence. Furthermore, when considering as attainment use to a car location by transit etc., when a car location was unknown, a car location was not able to be set as the Personal Digital Assistant as a walk destination, and the map to a car location was not able to be displayed.

[0008] Then, immediately after arriving at the car destination, let it be the 3rd purpose to enable it to acquire the map data to the last destination or the last destination etc. Moreover, even if a car location is unknown, let it be the 4th purpose to enable it to acquire the map and transit path data to a car location using a Personal Digital Assistant.

[0009] Moreover, when the car destination is a parking lot etc. in the navigation equipment which transmits and receives data between information centres, there is a problem of it becoming impossible for a communication link to notify the current position of a car and destination attainment to an information centre. Then, this invention makes it the 5th purpose to enable it to notify the arrival location and having arrived to an information centre using a Personal Digital Assistant, even if the point of arrival of a car is a communication link impossible point.

[0010]

[Means for Solving the Problem] A detection means to detect ignition-on of a car in invention according to claim 1. A check means to check the existence of the setting information set as the information centre in advance when ignition-on is detected by this detection means. Navigation equipment is made to possess a receiving means to receive the specific data transmitted from said information centre based on the check of this check means, and a specific processing means to perform specific processing based on the specific data received with this receiving means, and said 1st purpose is attained. A detection means to detect ignition-on of a car in invention according to claim 2. A check means to check the existence of the setting information registered into the information centre by self when ignition-on is detected by this detection means. An acquisition means to acquire the setting information concerned from said information centre when [that there is setting information registered into self by this check means] a thing check is carried out. Navigation ***** is made to provide a specific processing means to perform specific processing based on the setting information acquired with this acquisition means, and said 1st purpose is attained. In invention according to claim 3, in navigation equipment according to claim 2, the setting information registered into said addressing to self is the destination information for setting up the destination, and said specific processing means is characterized by to perform the transit path planning to the destination set up using the destination information acquired with said acquisition means, or guidance of a transit path for which it looked as said specific processing. In invention according to claim 4, in navigation equipment according to claim 2, the setting information registered into said addressing to self is the guidance information on a transit path, and said specific processing means performs guidance based on the guidance information on the transit path acquired with said acquisition means as said specific processing. In invention according to claim 5, said setting information is characterized by being the setting information transmitted from information processors, such as a Personal Digital Assistant, a personal computer, and navigation equipment, in claim 1, claim 2, and navigation equipment according to claim 3 or 4. In invention according to claim 6, an arrival decision means to judge whether the car arrived at the destination in navigation equipment given in any 1 claim of claim 1 to the claims 5, and a destination arrival transmitting means to transmit destination arrival and the car current position at said information centre when it is judged that it arrived at the destination with this arrival decision means are provided. In invention according to claim 7, in navigation equipment according to claim 6, said attainment decision means is characterized by judging that it arrived at the destination, when the car current position is in agreement with said destination, or when the distance of the car current position and said destination becomes below fixed distance. In invention according to claim 8, in the navigation equipment indicated to any 1 claim of claim 1 to the claims 7, when a car arrives at the car destination and said information centre and communication link cannot be performed at the car destination concerned, the car current position is transmitted to a Personal Digital Assistant.

[0011] A setting information receiving means to receive the setting information transmitted from information processors, such as a Personal Digital Assistant, a personal computer, and navigation equipment, in invention according to claim 9. A setting information storing means to store the setting information addressed to the specific phase hand who received with this setting information receiving means. From the navigation equipment indicated to any 1 claim of said claim 1 to the claims 7 Based on the acknowledge request of the existence of the setting information registered into self, with a check means to check whether setting information is stored in said setting information storing means, and this check means When it is checked that the setting information addressed to said navigation equipment which carried out said acknowledge request is stored, an information centre is made to possess a transmitting means to transmit said setting information to said navigation equipment. In invention according to claim 10, it sets to an information centre according to claim 9. The storing field and said navigation equipment of said setting information in said information processor and a setting information storing means are matched by ID for every user. Said setting information storing means When the receiving contents of said setting information receiving means include the setting demand to other users, it stores in the storing field of said setting information storing means corresponding to ID of other users of whom said received setting information was required. In invention according to claim 11, said setting information is characterized by being the destination information for setting up the destination in an information centre according to claim 9 or 10. the case where said received setting information is stored in the storing field of said setting information storing means corresponding to other users' ID demanded by said setting information storing means in an information centre according to claim 10 in invention according to claim 12 — being concerned — others — it is characterized by providing a notice means to tell a user about that. In invention according to claim 13, in an information centre according to claim 9, when the transmitting person and said specific phase hand of setting information differ from each other, it is characterized by providing a notice means to notify the contents of the purport or setting information that registration of setting information was carried out, to said specific phase hand. In invention according to claim 14, said notice means is

characterized by telling a user besides the above about that in an information centre according to claim 12 by the electronic mail, facsimile or data communication, and the voice communication by the voice data from which it synthesized voice. In an information centre given in any 1 claim of claim 9 to the claims 14 in invention according to claim 15 said setting information receiving means A car attainment decision means for the destination which receives the destination information for setting up the destination as said setting information, and is set up for this destination information to be able to reach by the car and to judge whether it is a point, When said destination is judged to be the point which cannot reach by the car with this car attainment decision means It has a car destination setting means to set up the point which can reach by the car around said destination as a car destination, and said transmitting means is characterized by transmitting the car destination information on said car destination to said navigation equipment. A destination information receiving means to receive the destination information transmitted from information processors, such as a Personal Digital Assistant, a personal computer, and navigation equipment, in invention according to claim 16, A car attainment decision means for the destination set up for the destination information received with this destination information receiving means to be able to reach by the car and to judge whether it is a point, A car destination setting means to set up the point which can reach by the car around said destination as a car destination when said destination is judged to be the point which cannot reach by the car with this car attainment decision means, A non-car moving trucking retrieval means to search for the moving trucking for arriving with non-car migration means other than a self-car from said car destination set up with this car destination setting means to said destination, An information centre is made to possess a moving trucking transmitting means to transmit the information on the moving trucking for which it was searched with this non-car moving trucking retrieval means to a Personal Digital Assistant. In invention according to claim 17, in an information centre according to claim 15, it has a destination arrival receiving means to receive the destination arrival information transmitted from navigation equipment, and the car current position, and said moving trucking transmitting means is characterized by transmitting said moving trucking to a Personal Digital Assistant, when the car current position received with said destination arrival information receiving means is the car destination set up with said car destination setting means. In invention according to claim 18, said non-car migration means is characterized by being at least one of public cars, such as a taxi and a bus, a cable car, a monorail, a ropeway, an electric car, a train, a ship, a moving walk, and on foot in an information centre according to claim 15. A car current position storing means to receive and store navigation equipment empty vehicle both the current positions in invention according to claim 19, A Personal Digital Assistant location receiving means to receive the current position from a Personal Digital Assistant, A non-car moving trucking retrieval means to search for the moving trucking for arriving at said car current position stored in said car current position storing means from the current position received with this personal digital assistant location receiving means with non-car migration means other than a car, An information centre is made to possess a moving trucking transmitting means to transmit the moving trucking for which it searched with this non-car moving trucking retrieval means to said Personal Digital Assistant.

[0012] A detection means to detect ignition-on of a car in invention according to claim 20, A check means to check the existence of the setting information set as the information centre in advance when ignition-on is detected by this detection means, A receiving means to receive the specific data transmitted from said information centre based on the check of this check means, Navigation equipment equipped with a specific processing means to perform specific processing based on the specific data received with this receiving means, A setting information receiving means to receive the setting information transmitted from information processors, such as a Personal Digital Assistant, a personal computer, and said navigation equipment, A setting information storing means to store the setting information received with this setting information receiving means, A check means to check whether setting information is stored in said setting information storing means based on the acknowledge request from said navigation equipment, When storing of setting information is checked with this check means, a guidance system is made to possess the information centre equipped with a specific data transmitting means to transmit specific data to said navigation equipment. In invention according to claim 21, it is characterized by for said setting information being destination information and said specific data being destination information or the guidance information on a transit path in a guidance system according to claim 20. In invention according to claim 22, it is the path sending set formed in the exterior of a Personal Digital Assistant, and is characterized by having a transmitting means to transmit the path from the car destination to the last destination to said Personal Digital Assistant before a car arrives at said car destination. In invention according to claim 23, it is the path sending set formed in the exterior of a Personal Digital Assistant, and is characterized by having a transmitting means to transmit the path from the car destination to the last destination to said Personal Digital Assistant when a car arrives at said car destination.

[0013]

[Embodiment of the Invention] Hereafter, the gestalt of suitable operation of this invention is explained to a detail with reference to drawing 30 from drawing 1.

(1) With the outline book operation gestalt of an operation gestalt, receive the screen and data for a destination setup from an information centre, set up the destination with Personal Digital Assistants, such as a cellular phone, and transmit to an information centre with a user's ID. The destination does not necessarily need to be the point which can reach by the car, and the point which cannot reach if non-car means, such as a walk and a cable car, are not used from the middle is sufficient as it. Thus, it is that which may be the point which cannot reach by the car (the existence of the recognition does not ask), it receives from an information centre in the case of a destination setup of data and the screen for the parking lot demand which makes a parking lot the guidance termination point of a car, and when chosen, a parking lot demand is also transmitted to an information centre. And if the destination

which the user **(ed) is received in an information centre, while storing in the user data corresponding to ID by making the received destination into the last destination, by the ability to run [whether a parking lot is located at the existence of a parking lot demand, and the last destination, and] by the car to the last destination, the car destination is set up and it stores in user data.

[0014] On the other hand, if a user takes a car and turns ON ignition, mounted equipment (navigation equipment) will start the communication link with an information centre (communicative establishment), and will check whether the destination is already set as the information centre. In an information centre, if the car destination is set as the corresponding user data of ID, the path planning from the current position transmitted from navigation equipment to the car destination [finishing / a setup] will be performed, and the transit path to recommend will be transmitted. Thus, since the transit path to the destination beforehand set up with the Personal Digital Assistant etc. by ignition-on is acquirable from an information centre immediately after ignition-on, a user does not need to perform a series of actuation to a destination setup and destination transmission in a car from powering on of navigation equipment. Moreover, the transit path to transmit can shorten communication link time amount by not transmitting all the transit paths to origin empty vehicle both destinations, but transmitting only the transit path for predetermined distance from the current position (it is about the communication link amount of data), and can leave it at an early stage in a car side. And if navigation equipment transmits a demand of a transit path again when it arrives at predetermined distance (for example, 200m) this side from the termination of a transit path [finishing / reception], an information centre will be again searched for the transit path from the car current position to the destination, and the transit path for predetermined distance will be transmitted to navigation equipment in it. Thus, the optimal transit path in consideration of the newest traffic information at the time of being about a demand can be transmitted by newly searching for the transit path to the destination, and transmitting predetermined distance every, whenever there is a demand.

[0015] If navigation equipment arrives at the car destination (path guidance termination with voice), it will transmit the current position of a car to an information centre. In an information centre, it searches for the moving trucking from the car current position to the last destination in non-car mode, the map picture according to moving trucking is created, and it transmits to the Personal Digital Assistant corresponding to ID. A Personal Digital Assistant performs guidance to the last destination by indicating the received map picture by sequential according to user actuation.

[0016] (2) The detail drawing 1 of the 1st operation gestalt expresses the configuration of the navigation system concerning the 1st operation gestalt. As shown in this drawing 1, the navigation system of this operation gestalt is constituted by an information centre 10, the navigation equipment 100 which is mounted equipment carried in the car V by the side of migration, and Personal Digital Assistant (PDA) 200 for the user of navigation equipment 100 carrying and assisting the function of navigation equipment 100. Although the communication link using wireless is performed and the communication configuration is based mainly on packet communication between an information centre 10 and navigation equipment 100, depending on navigation equipment 100, it may be based on line switching. On the other hand, between navigation equipment 100 and Personal Digital Assistant 200, when a Personal Digital Assistant is out of a car, and it connects mainly by line switching or packet communication and is in a car, it connects by wire communications, such as radio, such as infrared ray communication and SS (spectrum diffusion) communication link, or serial communication, and a parallel communication link.

[0017] Drawing 2 expresses the configuration of the information centre 10 in these navigation systems, navigation equipment 100, and Personal Digital Assistant 200. The information centre 10 is equipped with various equipments, such as the communications control section 12, the data-processing section 14, a database 40, the external information gathering section 70, and the other I/O sections. The communications control section 12 of an information centre 10 is the communication equipment containing a sending set and a receiving set, and is for transmitting and receiving data between navigation equipment 100 or Personal Digital Assistant 200. Various communication system, such as a land mobile radiotelephone, a cellular phone, and PHS, may be used.

[0018] The data-processing section 14 is equipped with CPU16 which performs data processing, and the memory 18 in which various kinds of programs and data are stored. Various kinds of programs performed in an information centre 10, such as the path planning program 20, the segment processing program 22, the guidance data extraction program 24, the destination judging program 25, and a system control program 26, are stored in memory 18. The path planning program 20 has the path planning program in the non-car mode in which it searches for the path (path using a walk path, a monorail, etc.) for reaching without using a car from the path planning program and car destination in the car mode in which it searches for the transit path by the car to origin (current position [of a car], or specified origin) empty vehicle both the destinations of a car to the last destination. The segment processing program 22 is a program which sets up the road length which transmits to a segment division [by which path planning was carried out in car mode / of a path], and car side. The guidance data extraction program 24 is a program which searches, extracts and edits the guidance data corresponding to the road length set up by the segment processing program 22. The destination judging program 25 is a program which judges the car destination and the last destination from the destination received from Personal Digital Assistant 200 or navigation equipment 100. A system control program 26 is a program which carries out control management of the actuation of the information centre 10 whole.

[0019] Moreover, the working area of the demand road length data 27 used for those program executions, the search-path data 28, and extract guidance data 29 grade is also secured to memory 18. Predetermined initial value is separately stored in memory 18 the sake [although the value received from navigation equipment 100 is stored in

working area, in case the demand road length data 27 are not transmitted from navigation equipment 100]. As initial value of this demand road length, although 10km is stored, otherwise, constant value, such as 5km, 15km, and 20 etc.km, is sufficient, for example. Moreover, you may make it change according to the residual distance (the distance on the transit path for which it searched, or slant range) to car current position empty vehicle both destinations. For example, initial value is enlarged, so that residual distance is long, and let initial value be a small value, so that residual distance is short. Moreover, you may make it change by road classification of a path which transmits to navigation equipment 100 as initial value of demand road length among the transit paths for which it searched. For example, the initial value in the case of being a highway (exclusive roads, such as Metropolitan Expressway, being included) is the largest, the initial value of a national highway and a prefectural road is large to the degree, and it is made to make the smallest initial value in the case of a city area road. You may make it combine road classification with the residual distance to the car destination.

[0020] The division path data divided for every segment of a predetermined unit by the segment processing program 22 in the transit path and this transit path to the car destination searched by the path planning program 20 are stored in the search-path data 28. Drawing 3 expresses notionally the data stored in the search-path data 28. As shown in this drawing 3, the search-path data 28 are divided into the division path 1, the division path 2, and the segment unit — so that all the transit paths to the car destination may be illustrated by drawing 3 (A). As shown in this drawing (B), a data head, crossing information, a traffic information, node information, mark information, etc. are included in each division path data.

[0021] A database 40 A recommendation path The data 42 for path planning for searching, and the data of path guidance The accumulated data 44 for guidance, and the data about a communications area The accumulated communications area data 46 and the accumulated destination The map picture for indicating the path to the data 48 for a destination setup, such as the telephone number to set up and the address, the user data 50 which collected the various information about a user, the parking lot data 52 which collected the locations and confusion situations of a parking lot, and the last destination searched in non-car mode by simple Data required for the collected path planning, such as the map picture creation data 54, and path guidance are stored. The data 42 for path planning contain the data about a crossing, the data about a road, the data about a node point, etc. Moreover, exclusive pedestrian roads where the data 42 for path planning are used by retrieval in non-car mode, such as a footbridge and a zebra zone, a car, and the data (a name of the station, point data, distance between points, Kursbuch, etc.) about the movable path by migration means other than a walk (a cable car, a monorail, a ropeway, an electric car, a train, a ship, a bus, a taxi, moving walk, etc.) are also contained. Various guidance data, such as map data of each crossing or a road, landmark data in which main facilities are shown, and voice guidance data, are contained in the data 44 for guidance. the area where an electric wave does not reach the communications area data 46 — even if it arrives — the communication link with a weak electric wave — the data about communication link situations, such as an unsuitable area, are contained.

[0022] the destination data which consist of the destination name about the facility which can be set up as a destination, a location, a point, etc., a destination code number, a coordinate (the LAT — slight), the telephone number, the address, and a zip code are stored in the data 48 for a destination setup. Viewpoint empty vehicle both regulations of the protection of nature are carried out not only like the facility which can reach with a car but like the hut in Oze as a destination which is stored and which can be set up, and a shuttle bus and on foot are stored from the middle like a required facility and Owakudani in Hakone from the middle also about the location which needs on foot [a ropeway and on foot]. These destination data are put in a database with the destination list of layered structures, and the genre data which classified all destinations according to the genre, the local data classified for every area are stored as destination related information required for a destination setup for it. Moreover, information with the destination explanatory to the data 48 for a destination setup If the destination is a hotel, for example, description information, such as existence of a hot spring, and efficacy of a hot spring, If the destination is an amusement park, it is the size (number which can be parked) and object age (are suitable more than the 3 years-old child) of a parking lot. It is suitable more than a schoolchild, and if it is description information, such as adult sense, etc. an admission fee, and a closing day, and a temple and is description information, such as a cult and the origin, and a golf course, description information, such as a play tariff, is also stored corresponding to each destination. Thus, it becomes possible to receive the retrieval conditions of "the location where a 5 or less-year-old child can play in nature in Kamakura" from the user of navigation equipment 100, to search a corresponding facility and a corresponding location with collecting and saving description information at abundance, and to carry out a destination setup by it. In addition, in such a destination setup, the demand (retrieval conditions) of the destination is acquired by voice message, and it may be made to perform a suitable destination setup because an operator assists.

[0023] Furthermore, the Web information for a destination setup (destination setting screen) which the Personal Digital Assistant and navigation equipment which have neither a program for a destination setup nor data for a destination setup transmit when a destination setting demand is carried out via the Internet with the browser (browser) software of WWW (World Wide Web) is also stored in the data 48 for a destination setup. Moreover, the parking lot existence data in which it is shown whether a parking lot is located at the destination corresponding to the data of each destination are also stored in the data 48 for a destination setup as attached data.

[0024] Drawing 4 expresses notionally the data stored in the user data 50. As for the user data 50, a user name, the user-identification (number ID) navigation equipment connection place, a Personal Digital Assistant connection place, the car current position, the car destination, the last destination, a shunt, start time, a parking lot demand, a

personal identification number, a mail address, etc. are stored for every use user of this navigation system. The telephone number of the land mobile radiotelephone by which the navigation equipment connection place is connected to navigation equipment 100, a cellular phone, PHS which are connected, etc., etc. is stored. The telephone number of Personal Digital Assistant 200 which may communicate between information centres 10 etc. is stored in a Personal Digital Assistant connection place. The telephone number for user authentication (1 or plurality) to which the telephone number for call origination in case an information centre 10 carries out a call request receives one and the call request from a Personal Digital Assistant is stored in the telephone number stored in a Personal Digital Assistant connection place. Start time can set up two or more destinations (car destination and the last destination), when it matches with the car destination and the last destination, and is stored and this start time is specified. You may make it store in this user data 50 the various data of others, such as a password used for user authentication.

[0025] As shown in drawing 2, the external information gathering section 70 is connected to the database 40. As external information which this external information gathering section 70 collects, there is various traffic information, such as delay information (a delay place, distance, extent of delay), construction information (the construction section and construction period), and an accident occurrence part (it is [whether an accident source location, extent of accident, and passing are possible and] processing termination anticipation time amount etc.), and all are used by the path planning processing in the path planning program 20 of the data-processing section 14. The external information gathering section 70 collects information (parking lot data 52), such as establishment of a road, a crossing, and traffic regulation, modification (data 42 for path planning) and establishment (the data 44 for guidance, data 48 for a destination setup) of a facility, modification (communications area data 46) of a communications area, full parking lot of a parking lot, a vacant taxi, and confusion, etc., and updates the data stored in the database 40 at any time again. This external information gathering section 70 collects such external information using means of communications, such as the telephone line and a dedicated line.

[0026] Next, the configuration of navigation equipment 100 is explained. Navigation equipment 100 is equipped with the data-processing section 101, memory 102, the location measurement section 104, the input section 105, a display 106, the voice output section 107, and the communications control section 108. The data-processing section 101 is constituted by the microcomputer system equipped with ROM and RAM focusing on CPU, and performs control which used the various data stored in data storage field 102B according to the various programs stored in program storage area 102A of memory 102.

[0027] Program storage area 102A of memory 102 It is based on the destination setting check program 142 performed by ignition-on, the destination setting program 144 which sets up the last destination and the becoming destination, and path data and guidance data transmitted from an information centre 10. Display a path and a landmark on a display 106, or The path guidance program 150 which outputs the voice of path guidance from the voice output section 107, the data request program 152 which compares the car current position with the path and guidance data which were received, and requires the path and guidance data to the following path, the control program 154 which controls the whole actuation, It is a storage for storing the program performed in the data-processing section 101.

[0028] Data storage field 102B of memory 102 functions as working area suitably used on the occasion of program execution, and also For example, the path and the guidance data 160 (path data and guidance data) transmitted from an information centre 10, car destination transmitted from an information centre 10, It is a storage for storing the last destination data 161, the ID data 162 of the car proper which transmits to an information centre 10, the car location data (LONG and LAT) 164 measured by the location measurement section 104, the data 166 for a destination setup, the demand road length data 168, etc. Except for the data collected and changed in the external information gathering section 70 of an information centre 10, destination data comparable as the data 48 for a destination setup, destination related information, description information, etc. are stored in the data 166 for a destination setup. In addition, the data 166 for a destination setup may also enable it to change data by establishment of a facility etc. The demand road length data 168 are [0029] although the initial value usually stored in the memory 18 of an information centre 10 is used. Two or more past location data are also contained in the car location data 164 besides the current position data of the car measured at intervals of predetermined time by the location measurement section 104. For example, the location data of the point of measurement included in fixed distance or the location data of a fixed number of point of measurement is memorized. If measurement is newly performed in the location measurement section 104, while the newest location data will be memorized, the location data memorized in ancient times are eliminated. The transit locus of a car can be obtained by tying the location data of these plurality. This transit locus is used for the so-called map matching for specifying the road the car is running.

[0030] The location measurement section 104 is for measuring the location of a car using the so-called GPS etc., and is equipped with a rate sensor, a bearing sensor, etc. for receiving the signal from two or more GPS Satellites, and measuring the GPS receiver of a car which measures a location absolutely, and the relative position of a car. A rate sensor and a bearing sensor are used for autonomous navigation. The relative position measured by these sensors is used for amending the positioning error of the absolute location measured by OK and the GPS receiver in the car current position [in the tunnel where a GPS receiver cannot receive the electric wave from a satellite etc.] etc.

[0031] Various switches, the touch panel attached in the screen of a display 106, remote control, the data entry unit using speech recognition, etc. are contained in the input section 105. By the touch panel, when a user touches with

a finger the icon displayed on the display 106, corresponding data and a corresponding instruction are inputted. In the data entry unit using speech recognition, when a user utters voice, data and the instruction corresponding to it are inputted.

[0032] A display 106 is a display by liquid crystal, CRT, etc., and as mentioned above, the touch panel is arranged on the front face. The voice output section 107 is equipped with the voice synthesizer and the loudspeaker, compounds the guidance voice in the case of performing path guidance to the destination, for example, the guidance voice "it is the right about the crossing of 100m beyond", based on the path guidance data of data storage field 102B, and outputs it from a loudspeaker. The loudspeaker which outputs such guidance voice may be made combination with the loudspeaker for mounted audios, and you may make it arrange the loudspeaker of dedication operation at the assembly in the section or the windshield upper parts (central upper part, drivers side upper part, etc.). The communications control section 108 is a communication device for performing transmission and reception of data an information centre 10 side, and is constituted by the communication equipment containing a sending set and a receiving set. This as well as a center side may use systems, such as a land mobile radiotelephone, a cellular phone, and PHS.

[0033] Next, the configuration of Personal Digital Assistant 200 is explained. As for Personal Digital Assistant 200, the cellular phone and PHS in which data communication is possible, an electronic notebook, a hand-held PC (Hand held PC), and other Personal Digital Assistants (PDA-personal Digital Assistants) mainly correspond. Personal Digital Assistant 200 illustrated to drawing 2 expresses the configuration common to these various devices, when performing various processings in this operation gestalt, and it is omitting it suitably about the configuration required only of the function of each supply proper, such as a cellular phone and an electronic notebook.

[0034] Personal Digital Assistant 200 is equipped with the data-processing section 201, memory 202, the input section 205, a display 206, the voice output section 207, and the communications control section 208. The data-processing section 201 of Personal Digital Assistant 200 is constituted by the microcomputer system equipped with ROM and RAM focusing on CPU, and performs control which used the various data stored in data storage field 202B according to the various programs stored in program storage area 202A of memory 202.

[0035] Program storage area 202A of memory 202 is a storage for storing programs performed in the data-processing section 201, such as the non-car path display program 252 which receives a non-car path with a map picture etc. from the destination setting program 250 which sets up the last destination and the becoming destination and is transmitted to an information centre 10, and an information centre 10, and is displayed on a display 206, and the control program 254 which controls actuation of the Personal Digital Assistant 200 whole. Data storage field 202B functions as working area suitably used on the occasion of program execution, and also is a storage for, for example, storing the path and the guidance data 260 (non-car path data and guidance data) transmitted from an information centre 10, the ID data 262 of the navigation equipment 100 registered into the information centre 10 corresponding to Personal Digital Assistant 200, and the data 266 for a destination setup. Except for the data collected and changed in the external information gathering section 70 of an information centre 10, destination data comparable as the data 48 for a destination setup, destination related information, etc. are stored in the data 266 for a destination setup. In addition, in order that the data 266 for a destination setup may reduce the amount of data of Personal Digital Assistant 200, you may make it store some of genre information and destination data. Only as for a destination name and a destination code number, as some destination data, only the telephone number and a destination name store the telephone number, a destination code number, etc., for example. Furthermore, in order to reduce the possession amount of data, you may make it store the data or all the data of these part only to some areas. It is not stored in the data 266 for a destination setup about the description information on the destination.

[0036] Although switches, such as a selectable ten key, are used for the input section 205 in the softswitch displayed on the display screen besides various exclusive switches, the touch panel attached in the screen of a display 206 depending on Personal Digital Assistant 200, remote control, and the input unit using speech recognition may be used.

[0037] As a display 206 is a display by liquid crystal etc. and being mentioned above, depending on Personal Digital Assistant 200, a touch panel may be arranged on a front face. The communications control section 208 is a communication device for performing transmission and reception of data an information centre 10 side, and is constituted by the communication equipment containing a sending set and a receiving set.

[0038] Although the navigation equipment 100 and Personal Digital Assistant 200 which were illustrated to drawing 2 are the configuration of having explained above, it is possible to take the configuration which changes with differences in a version or a model by this navigation system as the navigation equipment which can communicate between information centres 10, and a Personal Digital Assistant. For example, it is also possible to consider as navigation equipment 100 and Personal Digital Assistant 200 of the short form which does not have the data for a destination setup and a destination setting program, and sets up the destination using the Web information from an information centre 10. Moreover, although it does not have the data and the path planning program for path planning with the explained navigation equipment 100, it is possible, when it has an information centre, the data of this level, and a program and has the data for path planning and the path planning program of a short form, or also when it has the limited path planning program of the data for path planning of areas (the Kanto district, Tokai district, etc.), an information centre 10, and this level. moreover, the thing for which it has a GPS receiving set although Personal Digital Assistant 200 is not equipped with the location measurement section — becoming independent — a location — measurable — you may make .

[0039] Next, the actuation in the navigation system constituted in this way is explained. First, it explains, referring to drawing 5 and drawing 6 about a series of typical actuation by this operation gestalt as an outline of operation. Drawing 5 expresses a typical example of an exchange of the data of an information centre 10, and a navigation system 100 and Personal Digital Assistant 200. In instantiation of this drawing 5, the typical path guidance by the navigation system has prior destination setting processing, the navigation initiation processing by ignition, and the non-car moving trucking guidance processing to the last destination. Prior destination setting processing is processing (E0-E2, and Es and Ee show) which sets up the destination at points other than an origin, and is registered into an information centre 10 in advance, before leaving for an information centre 10 toward the destination. The navigation initiation processing by ignition-on is processing (F0-Fn, and Fs and Fe show) to which it shows a path to the car destination, checking the existence of a destination setup by ignition-on and carrying out the division acquisition of the search path from an information centre 10. The non-car moving trucking guidance processing to the last destination is processing (G0-G2, Gs, germanium) to which it shows the non-car moving trucking to the last destination, after a car arrives at the car destination.

[0040] In drawing 5, the communication link between Personal Digital Assistant 200 and an information centre 10 is expressed with a dotted line, and the communication link between navigation equipment 100 and an information centre 10 is expressed with an alternate long and short dash line. A communication link is started by Es, Fs, and Gs (the case of transmission of the call-request packet CR, and line switching call origination when it is packet communication (off-hook)), and a communication link is completed in Ee, Fe, and germanium (in being packet communication, reception of a disconnect-confirmed packet, and in the case of line switching, it cuts (on hook)).

[0041] When registering the destination into an information centre 10 in advance, as shown by the arrow head E0, in Personal Digital Assistant 200, a destination setup is performed beforehand. And as shown by the arrow head E1, ID of the installed destination, a shunt, and the navigation equipment 100 which parking-lot-requires and corresponds is transmitted to an information centre 10. In addition, a shunt and a parking lot demand are not transmitted when it is transmitted when chosen in a destination setup, and not chosen. In addition, although it is a case with typical transmitting the destination etc. to an information centre 10 from Personal Digital Assistant 200 as shown in drawing 5 In addition, when setting up the destination with navigation equipment 100 beforehand and transmitting to an information centre 10 (with the case where it transmits from self-equipment) When setting up the destination and transmitting at information processing terminals, such as personal computers which may be transmitted from other navigation equipments, such as home use and office, and a word processor, from the public telephone in which data communication is possible, a destination setup may be carried out and it may transmit. In an information centre 10, if the destination and ID which were set up by destination setting processing are transmitted, from the received destination, the last destination and the car destination will be judged and it will register with the user data corresponding to ID so that it may mention later with reference to drawing 8. In addition, this destination judging processing is performed, also when not only when the destination is set up in advance, but a car leaves and the destination is set up with the navigation equipment 100 of that car.

[0042] and if the car of navigation equipment 100 loading comes out and ignition-on is carried out, the path guidance to the car destination will be started. That is, if the ignition of the car carrying navigation equipment 100 is turned on as shown by the arrow head F0 of drawing 5, the communication link between navigation equipment 100 and an information centre 10 will be established, and destination setting check processing (drawing 9, drawing 10) of F1-F4 will be performed in (Fs) and both equipments. And when the destination is registered into the information centre 10 in advance, as an arrow head F5 shows, navigation equipment 100 notifies the current position, ID, demand road length, and a path guidance acquisition demand (not shown) to an information centre 10. In addition, it is transmitted when the demand road length data 168 are stored in data storage field 102B of navigation equipment 100 about demand road length. In an information centre 10, although later mentioned with reference to drawing 11, as an arrow head F6 shows, based on received data, path planning (car mode), segment division, and demand part guidance data extraction are performed. And as an arrow head F7 shows, the obtained path and guidance data are transmitted to navigation equipment 100.

[0043] The actuation in the above information centre 10 is explained with reference to drawing 6. If the destination is received from Personal Digital Assistant 200 or navigation equipment 100, an information centre 10 makes the received destination the last destination PT, and as shown in this drawing 6, when it cannot reach by the car to this last destination PT (the case where it shows around to a surrounding parking lot based on a parking lot demand is included), it will set up the car destination PA. And L1 shown according to a thick line is the transit path for which it was searched to termination location PD empty vehicle both the destinations PA of a received division path (car mode), and L2 shown by ***** is the path for which it was searched from the car destination PA to the last destination PT (non-car mode). M is a mark which shows the car location displayed corresponding to the current position of a car. When this search path L1 makes a unit predetermined distance (for example, 2km), it is divided into five segments S1-S5, and the points dividing [segment] are P1-P4. Supposing demand road length is LR, since it becomes transmitting road length > demand road length, the path data and guidance data of segments S1 and S2 will be transmitted to navigation equipment 100 by segments S1 and S2.

[0044] On the other hand, with navigation equipment 100, although later mentioned with reference to drawing 12, as the arrow head F8 of drawing 5 shows, path guidance is performed based on the path and guidance data which carried out division reception. In addition, the path and guidance data whose need was lost are canceled. Here, when the continuation data of path guidance are needed, as an arrow head F9 shows, the current position and a path guidance acquisition demand (request) are again notified to an information centre 10. Henceforth, if it carries out by

repeating the same actuation and arrives at the car destination until it reaches the destination, as an arrow head Fn shows, it will notify having arrived at the current position and the destination to an information centre 10, and the communication link between navigation equipment 100 and an information centre 10 will be ended.

[0045] When navigation equipment 100 empty-vehicle both destinations arrival is received, as an arrow head G0 shows an information centre 10, the current position of the car received collectively is stored and the path planning by the non-car mode from the current position to the last destination is performed (it mentions later by drawing 13). And as shown in an arrow head Gs, the communication link with the personal digital assistant connection place corresponding to the user data 50 of Relevance ID is started, and the guidance data based on the map picture to the last destination created by path planning as shown in an arrow head G1 are transmitted to Personal Digital Assistant 200. With Personal Digital Assistant 200 which received the map picture, the path by the non-car means to the last destination is guided by carrying out image display of the received map picture one by one according to actuation of a user so that it may mention later with reference to drawing 14 and drawing 15 (G2).

[0046] In addition, although drawing 5 explains the case where prior destination setting processing, navigation initiation processing by ignition, and non-vehicle migration both path guidance processing to the last destination are performed as a series of processings, it can perform independently. That is, when the last destination and the car destination are in agreement, non-car moving trucking guidance processing to the last destination is not performed. Moreover, although the destination set up by prior destination setting processing is surely used by the navigation initiation processing by ignition-on, the prior destination setting processing itself is not necessarily processing required for the navigation initiation processing by ignition-on. Navigation initiation processing by ignition-on in the condition that there is no prior destination setting processing can be performed. That is, with the 1st operation gestalt, prior destination setting processing or/and non-car moving trucking guidance to the last destination will be subordinately performed by considering navigation initiation processing by ignition-on as indispensable processing.

[0047] Next, sequential explanation of the detail of each actuation by the equipment which constitutes the above navigation system is given.

(A) Actuation (a) which is a destination setup The destination setting processing in Personal Digital Assistant 200 and navigation equipment 100 equipped with the destination setting program 250,144 and the data 266,166 for a destination setup is explained first. In addition, in the following explanation, although processing by Personal Digital Assistant 200 is explained, in navigation equipment 100, it is similarly performed by each part (it is each part with the same double figures the bottom) of the same name. If a destination setup is chosen, destination setting processing will be performed, and it is the data-processing section 201 (in being navigation equipment 100, the data-processing section 101 corresponds.), each part besides the following — being the same — image display of the input approach of "assignment from a local list", "assignment from a genre list", "the input of the telephone number", and "the input of the address" is carried out to a display 206 as a screen for a destination setup. And among four kinds of input approaches displayed by the input of a configurator, the post-decision key which moved cursor to the display of the desired input approach by the input section 205 (a joy stick and key) is pressed, or the input approach of the destination is chosen from from by inputting the input approach with voice etc. And when "assignment from a local list" and "a genre list to assignment" are chosen, the partition list of an area or genres is read from the data 266 for a destination setup, and it displays on a display 206. After acquiring selection of the area and genre which were chosen by the configurator here, the name of the destination classified into the selected area or a genre is displayed, and the destination is acquired. Moreover, when "the input of the telephone number" and "the input of the address" are chosen as the selection approach, the telephone number and the address are acquired by the input from the input section 205 (voice input and ten key) etc., and the destination is acquired from correspondence of the telephone number and the address which are stored in the data 266 for a destination setup, and the destination.

[0048] If the destination is acquired, the data-processing section 201 will check the existence of a parking lot demand, and the existence of start time assignment next. That is, the check screen of parking lot existence is displayed, the existence of a demand is checked to a configurator, subsequently the input screen of start time is displayed, and start time is checked. In addition, when the destination was determined and a send key is chosen by the configurator, it is treated as what does not boil a parking lot demand and assignment of start time.

[0049] The destination and when it is chosen, after a parking lot demand and/or start time are decided, data, such as a destination, are transmitted to an information centre 10 with ID of corresponding navigation equipment by selection of a send key. In addition, it may register with Personal Digital Assistant 200 beforehand, or you may make it input ID according to an individual about ID of corresponding navigation equipment 100 at the time of a destination setup in the case of the destination by Personal Digital Assistant 200. In a destination setup by navigation equipment 100, ID read from the ID data 162 is transmitted, but you may enable it to specify other ID by the input of a configurator on the other hand. By enabling it to specify other ID, when two cars (and navigation equipment 100) are owned, the destination in the case of running by one car can be set up from the car of another side.

[0050] (b) Next, explain the destination setting processing in Personal Digital Assistant 200 and the navigation equipment 100 which are not equipped with the destination setting program 250,144 and the data 266,166 for a destination setup. Although Personal Digital Assistant 200 is explained also in this case, in navigation equipment 100, it operates similarly. Drawing 7 expresses processing in case the browser software of WWW performs a destination setup to an information centre 10 via the Internet in Personal Digital Assistant 200 (there are many cases of a cellular phone or PHS) which does not have destination setting program 250 grade. As a premise by which destination setting processing shown in this drawing 7 is performed, although the menu screen of each Personal

Digital Assistant proper is displayed on the display 206 of Personal Digital Assistant 200, a destination setup can be chosen in this menu screen, other screens, or a function key. And in a menu screen etc., a NABIME new key (a name will not be asked if it is a key for a destination setup) shall be chosen. As a menu screen of a proper, if it is a cellular phone, a "telephone menu" key, a "data communication menu" key, etc. will be displayed on each Personal Digital Assistant 200 other than a "NABIME new" key, for example, and if it is an electronic notebook, a "schedule" key, a "address book" key, etc. will be displayed other than a "NABIME new" key. In addition, it may be chosen by the exclusive key for a destination setup (hardkeys, such as a switch instead of the softkey chosen from a display screen by software).

[0051] If selection of "NABIME nu" is supervised in destination setting processing and NABIME nu is chosen (step 10;Y), the data-processing section 201 of Personal Digital Assistant 200 will start the communication link with an information centre 10, will require transmission of NABIME nu of an information centre 10, and will acquire the Nabih menu screen (Web information) transmitted according to this demand (step 11). And the data-processing section 201 displays the acquired Nabih menu screen on a display 206 (step 12). this Nabih menu screen — for example, — "— 1. —" key which determines a destination — "— 2. — a screen display of the key for choosing the various actuation to look for, such as "key and a "setting [3.]" key, is carried out. Each of these keys are selectable softkeys by software, and after [which shifted and specified that key] carrying out a screen display by the scrolling key, or after specifying the number displayed before each key with a ten key, a key is chosen by carrying out the depression of the selection carbon button.

[0052] If the key "determines a destination" in the Nabih menu screen is chosen (step 13;Y), destination setting processing will be continued, the data-processing section 201 will require transmission of a destination list from an information centre 10, and the destination list transmitted according to this demand will be received (step 14). And the data-processing section 201 carries out a screen display of the acquired destination list to a display 206 (step 15), and if selection of the destination by the configurator is supervised and it decides (step 16;Y), the data-processing section 201 will transmit ID of the settled destination (shunt when [And] chosen), and the navigation equipment 100 registered corresponding to Personal Digital Assistant 200 concerned to an information centre 10.

[0053] Next, the data-processing section 201 receives the parking lot demand check screen transmitted from an information centre 10 by transmitting the destination etc., and displays it on a display 206, and it asks a configurator whether perform a destination setup (step 18). When the demand of a parking lot is chosen in a parking lot demand check screen (step 18;Y), the data-processing section 201 transmits a parking lot demand to an information centre 10 (step 19). And when not carrying out transmission or a parking lot demand of this parking lot demand, the start time setting screen transmitted from an information centre 10 is received, and it displays on a display 206, and it asks a configurator whether perform a start time setup (step 20). When performing a start time setup is chosen (step 20;Y), the data-processing section 201 displays the start time appointed screen on a display 206 (step 21), and supervises the start day by the configurator, and the input of time amount (step 22). And if the input of the start time on which start time or a start day is inputted into, and a definite key is pushed is decided (step 22;Y), the data-processing section 201 will transmit the settled start time (or start day) to an information centre 10 (step 23), and will end destination setting processing.

[0054] In addition, although destination setting processing in which it explained above explained the case where a destination list was displayed on the screen of a display 206, since the destination which can be set up exists in large quantities, you may make it set up the final destination by narrowing down the destination information hierarchized by acquiring and choosing them, using the conditions for choosing the destination as Web information one by one one by one. For example, it may be made to make demand, acquisition, display, and selection of the destination list which required, acquired, displayed and chose the local list and was extracted [list] after that in the genre list after a demand, acquisition, a display, and selection. In this case, when the selected genre is hierarchized further, it may be made to perform the demand of a multiple-times genre etc. until it becomes the genre of the lowest layer. Moreover, it may be made to perform narrowing down by the genre from the beginning, without performing the demand of a local list etc. Furthermore, it demands, acquires and indicates "it decides in a genre", "it decides with the telephone number", "it decides for the address", "it decides by the name", and "it decides for the purpose" as a list of methods which determine the destination, and you may make it choose the destination according to the method chosen either. If "it decides by the name" is chosen, sequential transmission will be carried out and the destination of the order of the Japanese syllabary will be displayed. After [this], as for "deciding by the name", a genre and an area are specified, it is good also as a selectable item. Selection of "it decides for the purpose" displays the purpose of car transit of an "overnight-stay travel", a "date", a "meal", etc., etc., for example.

[0055] (c) Destination judging processing drawing 8 is a flow chart showing actuation of the destination judging processing performed in an information centre 10, when the destination and ID are transmitted from Personal Digital Assistant 200 or navigation equipment 100. In addition, this destination judging processing is performed when the destination is received, and when setting up the destination within a car just before a start besides in case the destination is set up beforehand before a car leaves, it is performed also including the case of others.

[0056] If the data-processing section 14 of an information centre 10 supervises transmission of the destination from a user through the communications control section 12 (step 31) and the destination is received (step 31;Y), it is stored in the user data 50 of Relevance ID by making the received destination into the last destination etc. That is, these are also stored in the user data 50 of Relevance ID when a shunt, a parking lot demand, and start time assignment are also received, while storing the received destination in the last destination of the user data 50.

[0057] And it judges whether the data-processing section 14 has a parking lot demand in received data, and, in a certain case (step 33;Y), judges whether a parking lot is located further at the last destination (received destination) from the attached data of the data 48 for a destination setup (step 34). When there is no parking lot in the last destination (step 34; N), the data-processing section 14 searches with the parking lot data 52 the parking lot which exists around a parking lot (step 35), and by making the searched parking lot into the car destination, it is stored in the user data 50 of Relevance ID (step 36), and it carries out a return to the main routine by the system control program 26.

[0058] On the other hand, when there is no parking lot demand in the data received from the user (step 33; N), it judges whether transit with a car is possible for the data-processing section 14 to the last destination (step 37). When it can run to the last destination (step 37;Y), and when there is a parking lot demand and a parking lot exists in the last destination (step 33;Y, step 34;Y), by making into the car destination the destination received from the last destination 200, i.e., a Personal Digital Assistant, or navigation equipment 100, the data-processing section 14 is stored in the user data 50 of Relevance ID, and carries out a return to a main routine (step 38). When the last destination is the point it cannot run by the car (step 37; N), from the last destination, by making into the car destination the nearby point which can be run, the data-processing section 14 is stored in the user data 50 of Relevance ID, and carries out a return to a main routine (step 39). In addition, a line case and when the data-processing section 14 searches a nearby parking lot from parking lot data (step 35), it will judge decision (step 37) whether it can run to the existence (step 34) and the last destination of a parking lot including whether it corresponds to the area and period which have been set as the object of private car regulation or car regulation.

[0059] Thus, while storing the received destination as the last destination, he is trying to set up the car destination automatically separately from the last destination in an information centre 10. Therefore, in case a destination setup is carried out, when it checks about the existence of a parking lot or there is no parking lot, it is not necessary to carry out a destination setup in search of a surrounding parking lot, and a point to arrive at finally including on foot etc. can be set up as a destination. For example, since the Myojin pond is only set up as a destination and a **** parking lot is set up as a car destination as a point around the destination (or parking lot) which can be run, without investigating the existence of the private car regulation in Kamikochi, or a parking lot, a destination configurator can perform a destination setup simply to go to the Myojin pond in Kamikochi. And about migration by means other than the car (self-car) from the car destination to the last destination, it becomes possible to reach by receiving the map picture created in the below-mentioned last destination retrieval processing with Personal Digital Assistant 200.

[0060] (B) Explain the whole processing which performs path guidance to the car destination set up in path guidance, next the information centre of until the car destination.

(a) Destination setting check processing (mounted equipment; navigation equipment)

Drawing 9 is a flow chart showing actuation of destination setting check processing when ignition is turned ON in car equipment. If navigation equipment 100 is interlocked with ON of ignition, a power source is switched on automatically and ignition is turned on (step 41;Y), it will stand by that transmit a destination acknowledge request and ID to an information centre 10 through the communications control section 108 immediately (step 42), and a destination check result is transmitted from an information centre 10. And when destination un-setting up is received as a destination check result from an information centre 10 (step 43; N), the data-processing section 101 supervises whether destination setting processing was chosen in the input section 105 (step 44). When destination setting processing is chosen (step 44;Y), the data-processing section 101 performs destination setting processing by the mounted equipment mentioned above (step 45), and transmits the destination (a parking lot demand and/or start time when [And] set up) to an information centre 10 (step 46). Transmission of this destination etc. performs destination judging processing (drawing 8) mentioned above in an information centre 10. And the data-processing section 101 receives the car destination and the last destination data 166 which are successively transmitted from an information centre 10, and stores them in data storage field 102B (step 47), and after that, it performs request and path guidance processing later mentioned by drawing 12 (step 48), and it carries out a return to the main routine by the control program 154.

[0061] On the other hand, since the destination is already set up when destination setting ending is received as a check result of a destination acknowledge request (step 43), the data-processing section 101 receives the car destination and the last destination data 166 which are successively transmitted from an information centre 10, stores them in data storage field 102B (step 47), and performs request and path guidance processing immediately (step 48). Thus, when the destination is beforehand set as the information centre 10, it becomes possible to start transit while the user who took the car performs request and path planning processing immediately and receives path guidance toward the destination by ignition-on surely performed before transit initiation, without performing a series of actuation from powering on of navigation equipment 100 to a destination setup.

[0062] (b) Destination setting check processing (information centre)

Drawing 10 is a flow chart showing actuation of the destination setting check processing in an information centre 10. If the data-processing section 14 of an information centre 10 is supervising the destination acknowledge request from navigation equipment 100 and has a demand (step 50;Y), it will check the user data 50 of Relevance ID (step 51), and will check whether the car destination and start time are stored (step 52, step 53). When both the car destination and start time are stored (step 52;Y, step 53;Y), the start day stored checks further ***** today (step 54). When a start day is today (step 54;Y), and when [although the car destination is stored,] there is no assignment of a start day (step 53; N), the data-processing section 14 transmits destination setting ending to navigation equipment 100 as a check result of destination setting check processing (step 55), and transmits the car

destination [still finishing / a setup] and the last destination to navigation equipment 100 (step 59). And the path planning and guidance data transmitting processing (drawing 11) mentioned later are performed (step 60), and a return is carried out to the main routine by the system control program 26.

[0063] On the other hand, when the car destination is not stored in the user data 50 of Relevance ID (step 52), and when [although the car destination and start time are stored,] it is not today's start (step 54; N), the data-processing section 14 transmits to navigation equipment 100 by making destination un-setting up into a destination setting check result (step 56). The data-processing section 14 supervises whether in navigation equipment 100, destination setting processing (step 45 of drawing 9) was performed by destination transmission which is not set [this] up, and the destination was transmitted (this step 46) (drawing 10 ; step 57). And when the destination is received (step 57;Y), destination judging processing in which it explained by drawing 8 is performed (step 58), and the car destination and the last destination which were set up by this destination judging processing are transmitted to navigation equipment 100 (step 59). Path planning and guidance data transmitting processing are performed after that (step 60), and a return is carried out to a main routine. Since a car can be judged that transit which does not need path guidance is performed when not receiving the destination (step 57; N), after [which ends the communication link with navigation equipment 100] carrying out (step 61), the return of the data-processing section 101 is carried out to a main routine, without carrying out path planning etc.

[0064] Next, the path planning and guidance data transmitting processing by the side of the information centre 10 which divides the transit path for which it searched per predetermined, and is transmitted to the car destination (drawing 11), and the request and path guidance processing by the side of the navigation equipment 100 which carries out path guidance to the car destination while carrying out the sequential demand of the transmission of a division path (drawing 12) are explained.

[0065] (c) As shown in path planning and guidance data transmitting processing drawing 11 , the data-processing section 14 of an information centre 10 supervises whether the path guidance data acquisition demand (request) was received from navigation equipment 100 (mounted equipment) (step 65), and when it receives (;Y), extract the car current position included in receipt information (step 66). Next, when demand road length is specified in receipt information, the demand road length specified (step 67;Y) is stored in the demand road length data 27 of memory 18 (step 68), and when not specified (step 67; N), the initial value currently beforehand prepared as demand road length is set up and stored in the demand road length data 27 (step 69).

[0066] Next, the data-processing section 14 searches for the path to car current position empty vehicle both destinations (step 70). Path planning is performed with reference to the data 42 for path planning of a database 40, i.e., crossing data, road data, and node data. This path planning processing is well-known, for example, it is carried out by the approach indicated by JP,1-173297,A and JP,1-173298,A, and a recommendation path is set up on condition that the distance of the whole path making the shortest thing an optimal path etc. This gestalt is searched for the path to car current position empty vehicle both destinations whenever it receives a request from navigation equipment 100 (step 65;Y). By the external information gathering section 70, from the exterior, traffic informations, traffic information, etc. on passing by the condition of delay and the occurrence of distance and accident, such as improper and the construction section, are acquired, and the database 40 is updated by the newest information in the information centre 10. For this reason, a car side is provided with the newest recommendation path based on data and its newest guidance data from a car side always, such as avoiding delay etc. by performing path planning for every request.

[0067] Next, the data-processing section 14 performs the segment processing program 22 stored in memory 18, and divides the transit path to the searched car destination for every segment which is the unit of navigation (step 71). the unit to divide — data size regularity (for example, one segment is 1024 bytes) and road Choichi — laws (for example, 1km, 2 etc.km, etc.) etc. can be considered. All the paths for which it was searched are divided into the division path 1, the division path 2, and as shown in drawing 3 (A). Each division path is one segment. As shown in the drawing 3 Fig. (B), a data head, crossing information, a traffic information, node information, mark information, etc. are included in each division path data.

[0068] Even if the communication link with the (i) information centre 10 and navigation equipment 100 is interrupted by segmenting such data, about the segment which transmission had ended at the time of interruption, it is effective in what is necessary being just to resend from the segment which was being transmitted at the time of (ii) interruption which can perform path guidance as it is. If another word is carried out, a segment will be the information unit which can be decoded by the car side. for example, — supposing it transmits 10km a path and guidance data to a car side as one file on the whole and is not able to decode by the car side — this — path guidance cannot be performed about 10km all. However, it becomes possible to decode a file and to carry out path guidance for every segment, by dividing and file-izing to the segment in every 2km.

[0069] Next, within the limits of the path for which it searched, the data-processing section 14 adds one segment nearest to a car location in order (step 72), and computes the road length of a transmitting road (step 73). That is, it is carrying out by repeating the operation of the road length of a segment of which the transmitting road length + addition was done before the transmitting road length (total road length of segment) = segment addition, and adds one segment at a time. And the addition of a segment is performed until the total transmitting road length which added and got the die length of the road included in each segment becomes longer than demand road Cho who stored in the user data 50 of the ID concerned (step 74; N).

[0070] When it comes to transmitting road length > demand road length (or transmitting road length \geq demand road length), consequently, (step 74; Y) and the data-processing section 14 The guidance data extraction program 24

stored in memory 18 is performed, the guidance data of the range equivalent to transmitting road length are searched and extracted with reference to the data 44 for guidance of a database 40, and it stores in the extract guidance data 29 of memory 18 (step 75). The path data obtained as mentioned above and guidance data are transmitted to the navigation equipment 100 of ID which requested through the communications control section 12 (step 76). At this time, the segmented path and guidance data are transmitted to a car side sequentially from the thing near the car current position.

[0071] (d) Explain the request and path guidance processing performed with navigation equipment 100 corresponding to a request and path guidance processing, next the path planning and guidance data transmitting processing by the information centre 10 explained above according to the flow chart of drawing 12. As shown in drawing 12, the data-processing section 101 of navigation equipment 100 transmits the car current position and a request (path guidance data acquisition demand), and demand road length to an information centre 10 (step 80). The 1st demand road length of the beginning transmits here, when the demand road length data 168 are stored.

[0072] And if it supervises whether the data-processing section 101 received the path and guidance data (division road data) divided from the information centre 10 corresponding to demand road length (step 81) and receives (Y), a path and the guidance data 160 will be stored in memory 102, and path guidance by the path guidance program 150 of memory 102 will be performed (step 82). It make the voice guidance "they be the right/left about the crossing of about 200m beyond" output from the voice output section 107 as path guidance, in the predetermined distance this side of the crossing which should make a course change, while the data processing section 101 display the map and landmark of a path on a display 106, refer to the car current position in the location measurement section 104.

[0073] The path and guidance data received from an information centre 10 with this operation gestalt receive the division path extracted from the transit path which newly carried out path planning for every request of a division path instead of the data of all the transit paths to the car destination. And in the path planning newly performed according to a request, the newest traffic information and the traffic information which are always collected in the external information gathering section 70 are used. Therefore, the path which differs from the transit path for which it searched at the time of a start by change (delay, the occurrence of accident, etc.) of the road situation under transit may be extracted as a division path. Thus, an optimal path at present can always be received and guided by receiving a division path also to change of the road situation generated during transit. Moreover, it can respond flexibly also about modification of the destination. Furthermore, only the division path of the path length (transmitting road length) corresponding to the needing demand road length can be received from an information centre 10, and the data reception according to the memory space of navigation equipment 100 is attained.

Moreover, since it considers as the small amount of received data by receiving the division path corresponding to demand road length and reception of a division path is completed for a short time, compared with the case where all transit paths are received, initiation of car transit and initiation of path guidance can be carried out early. Moreover, since the path planning to car current position empty vehicle both destinations is performed for every request, even when a car deviates from a path, for example, at requesting in the current position path on the street from which it deviated, the path and guidance data to the car destination can be obtained, and it can operate in comfort.

[0074] During path guidance, the data-processing section 101 acquires the present location of a car from the location measurement section 104 for every predetermined time interval, if it has not supervised and (step 83) reached [whether it arrived at the location of fixed distance (for example, 200m) this side, and] (Y), it returns from the termination of the division path in which the car is stored in a path and the guidance data 160 to step 82, and it continues path guidance. And if a car arrives at the location of above-mentioned fixed distance this side from the termination of a division path (step 83;Y), it will judge whether the termination of the data-processing section 101 of a division path corresponds with the car destination (step 84). If division path termination is not in agreement with the car destination (step 84; N), it returns to step 80, the car current position and a request (path guidance data acquisition demand) are again transmitted to an information centre 10, and following division path reception and path guidance are continued.

[0075] When the termination of a division path is in agreement with the car destination (step 84;Y), if the data-processing section 101 judges whether the car arrived at the car destination (step 85) and has not arrived at the car destination (step 85; N), it returns to step 82 and continues path guidance. On the other hand, when it arrives at the car destination (step 85;Y), the data-processing section 101 transmits to an information centre 10 (step 86), and carries out the return of having arrived at the car current position and the car destination to the main routine by the control program 154. In addition, the mileage to the car destination besides when a car actually arrives at the car destination is less than 500m, and decision whether it arrived to the car destination is judged to have arrived to the car destination when it arrives at the location (circumference of the car destination) after passing through the path guidance point of the last with voice.

[0076] (C) Path guidance, next the car of until the last destination explain guidance to the last destination after arriving at the car destination.

(a) Last destination retrieval processing drawing 13 is a flow chart showing actuation of the last destination retrieval processing in an information centre 10. If the data-processing section 14 of an information centre 10 is supervising transmission of navigation equipment 100 empty-vehicle both destinations arrival (step 90) and car destination arrival is received (step 90;Y), it stores in the user data 50 of Relevance ID the car current position transmitted to coincidence (step 91). Here, in spite of storing the car destination in the user data 50, the car current position is separately stored, because it thinks also when necessarily not restricting having arrived at the car destination set up by destination judging processing (drawing 8) of an information centre 10, for example, having arrived at another

parking lot etc. Moreover, since the car destination is eliminated at the predetermined times (a car destination arrival time point, the last destination arrival time point, etc.) for the next destination setup, it is because an information centre 10 can recognize a car location by storing the car current position apart from the last destination.

[0077] It judges whether the stored car current position of the data-processing section 14 corresponds with the last destination (step 92), and when in agreement, a return is carried out to the main routine by (step 92; Y) and the system control program 26. On the other hand, when the car current position is not the last destination (step 92; N), the data-processing section 14 searches for the path from the car current position by non-car mode to the last destination (step 93). That is, the data-processing section 14 uses the data 42 for path planning including exclusive pedestrian roads use by retrieval in non-car mode, such as a footbridge and a zebra zone, a car, or the data (a name of the station, point data, distance between points, Kursbuch, etc.) about the movable path by migration means other than a walk (a cable car, a monorail, a ropeway, an electric car, a train, a ship, a bus, a taxi, moving walk, etc.), and searches for the moving trucking to the last destination.

[0078] And the data-processing section 14 creates moving trucking with a map picture using the map picture of the map picture creation data 54 according to the moving trucking to the searched last destination (step 94). Drawing 14 illustrates a map picture to the movable last destination only by the walk created in an information centre 10. As shown in drawing 14, as a map picture, path general drawing (a) including the car current position M (it displays by the emblem of black-lacquered ** into O) and the last destination PT (it displays by emblem *) and crossing Fig. [about main crossings and the crossing which carries out a right and left chip box] (b) – (d) are created. And the road to display is displayed in the straight line passing through each crossing. Moreover, a road is displayed by the size according to the actual width of street. The emblem and/or name of facilities (a station, a hospital, alternation, a school, a gas station, a hotel, a restaurant, a shrine, park, etc.) with which path general drawing (a) and crossing Fig. (b) – (d) becomes the mark of path guidance on the way are displayed into a map picture. You may make it use the landmark of the data 44 for guidance as an emblem of the facility used as a mark. Moreover, the crossing number the sequence passed from the car current position was numbered is displayed on a path complete diagram in a figure with a round head, and the crossing Fig. of an assignment number is displayed by specifying this figure with a ten key etc. In a crossing Fig., the same crossing number as the crossing number of path general drawing (a) is displayed in a figure with a round head. Moreover, the travelling direction after passing through each crossing is shown by the arrow head P. Thus, while lessening the amount of data which transmits to Personal Digital Assistant 200 by creating not a detailed road map but the easy map picture which consists of a road which consists of a straight line, and an emblem, a display becomes possible even if an image display field is the narrow (there are few dots) display 206. Moreover, it becomes easy to recognize the moving trucking to the last destination by the emblem intuitively.

[0079] Drawing 15 illustrates the map picture in the case of moving to the last destination using non-car means, such as an electric car, in addition to a walk. In the example of this drawing, the last destination is Tokyo EQ-R (EQUOSU, Inc. research), and it is an example in case from the Hamamatsucho station to the outskirts of Ochanomizu cannot move by the car by road regulation etc. but the parking lot in front of the Hamamatsucho station is set up as a car destination. In such a case, the migration schematic diagram of drawing 15 (a), the path general drawing of drawing 15 (b), and the crossing Fig. (for example, drawing 14 (b) – (b)) that is not illustrated are created. In the migration schematic diagram of drawing 15 (a), it indicates that it moves in JR Yamanote Line from the Hamamatsucho station of the car destination to Ochanomizu, and moves from the Ochanomizu station to Tokyo EQ-R of the last destination on foot. As shown in this drawing 15 (a), when means other than a walk are used, a migration schematic diagram is created, and the migration section (migration facility name) by the migration means and its migration means is displayed. And to the migration section by on foot, the path general drawing of drawing 15 (b) and the crossing Fig. which is not illustrated if needed are created. In addition, an every place painting is hierarchized and is hierarchized in order of the migration conceptual-diagram, path general drawing, and crossing Fig. About a migration conceptual diagram and path general drawing, it may hierarchize further like the case where two or more drawings exist in the same hierarchy like a crossing Fig., and for example, a migration conceptual diagram (general drawing) and a migration conceptual diagram (detail).

[0080] If the above map picture is created, the data-processing section 14 connects a circuit with the personal digital assistant connection place stored in the user data 50 of Relevance ID (for example, it is because it telephones), and it will transmit the map picture to the created last destination to Personal Digital Assistant 200 concerned (drawing 13 ; step 95), and it will carry out a return to the main routine by the system control program.

[0081] (b) In path guidance Personal Digital Assistant 200 with the map picture of Personal Digital Assistant 200, if the path and the guidance data 260 (map picture) transmitted from an information centre 10 are received, it will store in data storage field 202B, and the map picture of the maximum upper layer will be displayed on a display 206 in the received map picture. In addition, only the display of the purport that there was arrival of a map picture is performed to a display 206, and when a map picture display is chosen by the input section 205, you may make it display. Personal Digital Assistant 200 displays the next screen, when degree key and screen [degree] selection keys (the “->” key, the “**” key, etc.) are specified by the user after displaying the map picture of the maximum upper layer. Moreover, when the number corresponding to the figure (figure with a round head in drawing 14 (a)) displayed on the screen is specified with a ten key etc., a corresponding crossing Fig. is displayed.

[0082] A user checks the display screen of Personal Digital Assistant 200, and it moves in the direction of travelling direction arrow-head P by which a screen display is carried out, taking correspondence with an actual object and an

actual emblem, and it becomes possible to reach to the last destination by displaying degree screen according to migration.

[0083] Although the case where it did not have the data for path planning and a path planning program was explained, navigation equipment 100 may be equipped with the data for path planning, and a path planning program, and you may make it, as for the navigation equipment 100 in the 1st operation gestalt explained above, further equipped with the data for guidance (modification 11). If ignition is turned on, the navigation equipment 100 in this case will transmit a destination acknowledge request and ID to an information centre 10, and will check whether the destination is set up in advance. In an information centre 10, when the destination is not set as the user data 50 corresponding to ID (the case where the conditions of a start day are not fulfilled is included although set up), it transmits destination un-setting up to navigation equipment 100, and a communication link is ended. When the destination is set up, the destination (or car destination and the last destination) is transmitted to navigation equipment 100, and a communication link is ended.

[0084] With navigation equipment 100, reception of destination un-setting up or the destination (or car destination and the last destination) ends a communication link. When the destination (or car destination and the last destination) is received, navigation equipment 100 searches for the transit path from the car current position to the destination, and performs path guidance according to the transit path for which it searched. Also in this modification 11, when the car destination and the last destination (the car destination != last destination) are received When navigation equipment 100 ends the path guidance to the car destination, it transmits destination arrival and the car current position to an information centre 10. An information centre 10 transmits the map picture which searched for and created the non-car moving trucking from the car current position to the last destination in non-car mode to Personal Digital Assistant 200 of Relevance ID, when destination arrival is received.

[0085] In this modification 11, even if navigation equipment 100 is selectable in the mode in which the path planning to the destination is performed within self-equipment, and the mode performed in an information centre, it is good (modification 12). In this case, in the case of the for example comparatively near destination, navigation equipment 100 performs path planning with self-equipment, and, in the case of the distant (in a certain case [For example, a slant range 100km or more]) destination, receives a transit path from an information centre 10 for early acquisition of a transit path. When receiving a transit path, the optimal path reflecting the newest traffic information in all the paths to the distant destination etc. can be guided by requesting that the 1st operation gestalt explained to an information centre 10, and carrying out sequential reception of the division path.

[0086] Moreover, the path planning to the destination etc. is performed within self-equipment, and it is the purpose supplementary to the data which navigation equipment 100 does not hold, and you may make it receive the destination (or car destination and the last destination) set as beforehand from the information centre 10 by ignition-on depending on navigation equipment 100, and receive from an information centre 10 by the data used for guidance of a transit path (modification 13). For example, in order to make size of memory 102 small, it is made for navigation equipment 100 not to hold the data of a crossing enlarged drawing etc. And crossing expansion on the transit path to the destination searched navigation equipment 100 [0087] Although the explained 1st operation gestalt explained the case of the navigation equipment 100 altogether explained by drawing 1 as navigation equipment 100 with which user registration is carried out to an information centre 10, and ID is given to it You may be the navigation equipment which the configuration of each navigation equipment did not necessarily need to be the same, and was explained with the 1st operation gestalt, the navigation equipment explained in the modification 11, other programs, data, and the various navigation equipments with which functions differ, respectively (modification 14). In this case, navigation equipment 100 transmits the information the data wishing transmitting which specify the information which expects transmission of an information centre 10 after a destination setting check by ignition-on to an information centre 10. In an information centre 10, the division path (according to a request, it transmits in the division path explained with the 1st operation gestalt) to all the transit paths, destination, or the last destination to the destination, the car destination and the last destination, the destination, or the last destination etc. is transmitted according to these information the data wishing transmitting.

[0088] When destination judging processing was performed at the time of reception of the destination and the destination is set up in advance, it may become impossible moreover, to arrive at the car destination [finishing / a setup] by change of traffic restriction etc. before start time, although destination judging processing (drawing 8) in which it explained with the 1st operation gestalt explained the case where it performed when an information centre 10 receives the destination and ID. Then, when the first request suits, or when a destination acknowledge request suits, it may be made to perform destination judging processing (modification 15). Thereby, the optimal car destination and the last destination in start time can be judged.

[0089] Even if it is the case of a modification 15, in **** and such a case, possibility that the parking lot set up as a car destination becomes full parking lot for example, and it becomes impossible to park a car can also arrive at the car destination also in a modification 15. Then, whenever an information centre 10 has a demand of a division path based on the traffic information collected in the external information gathering section 70, it may be made to perform destination judging processing including the full-parking-lot information on a parking lot etc. (modification 16). Moreover, when destination judging processing reaches within predetermined distance (for example, 10km) from the car destination set up first, it may be made to perform it (modification 16').

[0090] With the explained 1st operation gestalt, it sets to the last destination retrieval processing (drawing 13). Although the moving trucking from the car current position to the last destination is searched in non-car mode (step 93), the map picture of moving trucking is created (step 94) and it was made to transmit to Personal Digital

Assistant 200 (step 95) You may make it transmit map data including the car destination and the last destination, and the data of a car destination point and the last destination point to Personal Digital Assistant 200 (modification 17).

[0091] Moreover, although it is made to perform creation (step 94) of the path planning (step 93) in non-car mode, and a map picture each time in the last destination processing (drawing 13) when car destination arrival is received and a car current position location is not in agreement with the last destination The pictorial map to the car destination (car current position) and the last destination which are used well is created beforehand, and you may make it store in a database 40 with the combination of the car destination and the last destination (modification 18). In this case, it will search with an information centre 10 whether the combination of the car destination corresponding to the received car current position and the last destination is in a database 40, and if there is nothing, steps 93 and 94 of drawing 13 are performed, and if it is, the pictorial map stored with combination will be read and it will transmit to Personal Digital Assistant 200 (step 95).

[0092] When a map picture is created, in the last destination processing (drawing 13) moreover, the data-processing section 14 Connect a circuit with the personal digital assistant connection place of Relevance ID (for example, it is because it telephones), and although it was made to carry out direct transmission (step 95) of the map picture to the created last destination to Personal Digital Assistant 200 concerned You may make it transmit data, such as a created map picture, to the mail address of Relevance ID as e-mail (modification 19). In this case, the information processor of Personal Digital Assistant 200 and others can be used, and data, such as a map picture, can be downloaded and displayed from a self mail address.

[0093] (3) the 2nd operation gestalt — explain the 2nd operation gestalt below. In addition, since it is the same as that of the 1st operation gestalt almost about the configuration of the information centre 10 in each operation gestalt after the 2nd operation gestalt, navigation equipment 100, and Personal Digital Assistant 200, a different configuration from the 1st operation gestalt shall be explained, and it shall omit suitably about the same part. Although it enabled it to set the destination as an information centre 10 beforehand with the 1st operation gestalt before the car left, a setup place sets up the destination only to one user (self ID mainly) data 50 to the last. However, it may run by whether being the same destination Mukai in the same time with two or more cars like [in the case of performing golf] with two or more members. In such a case, it is necessary to repeat presetting of the same destination each number of member times, and, according to the 1st operation gestalt, useless actuation will overlap.

[0094] Then, it enables it to perform a destination setup to two or more members by one destination setup by one person with the 2nd operation gestalt. That is, with the 2nd operation gestalt, it is made to perform a destination setup in broadcast. Therefore, with Personal Digital Assistant 200 and the navigation equipment 100 in the 2nd operation gestalt, while having a destination transmitting member setting processing program in this operation gestalt, it has the browser software of WWW for acquiring the member candidate list screen which is equipped with the candidate list data of the member who sets up the destination, or chooses a destination transmitting member from an information centre 10 as Web information. On the other hand, in the information centre 10 in the 2nd operation gestalt, it changes into the destination judging program 25, and the destination judging program for the 2nd operation gestalt is stored in memory 18, and the member candidate list is stored in the database 40. A member candidate list is stored in the corresponding user data 50 for every user of each ID.

[0095] Drawing 16 is a flow chart showing actuation of the destination transmitting member setting processing performed in Personal Digital Assistant 200 and navigation equipment 100. In addition, in the following explanation of operation, although explained as processing by Personal Digital Assistant 200, in navigation equipment 100, it is processed similarly. In this case, explanation of each part of Personal Digital Assistant 200 of operation serves as actuation of each part of the navigation equipment 100 whose double digits correspond the bottom like processing of a destination setup in the 1st operation gestalt. For example, the data-processing section 201 in Personal Digital Assistant 200 corresponds to the data-processing section 101 in navigation equipment 100.

[0096] The data-processing section 201 performs destination setting processing first (step 101). This destination setting processing is the same as destination setting processing in which it explained with the 1st operation gestalt, and when Personal Digital Assistant 200 is equipped with the destination setting program 250 and the data 266 for a destination setup, the destination (a parking lot demand and start time are included) chosen from the data for a destination setup is transmitted to an information centre 10. On the other hand, when these program or data cannot be found, destination setting processing using the Web information explained by drawing 7 is performed. In this case, the selection screen where the key and the item were displayed in order to choose a need matter, the item which acquired the user list etc. from the information centre 10 using Web information, and was chosen, and data including other processings will be transmitted to an information centre 10. Although the case where it has a program and data is explained hereafter, when based on Web information, it is carried out similarly. In addition, when a multiple address setup of the destination by this operation gestalt is performed, in this destination setting processing, start time is usually set up, but since it may be set as a start daily allowance day, a setup of start time is not necessarily made into the indispensable setting matter.

[0097] The data-processing section 201 judges after that whether "a member setup" was chosen from the display screen by the user (step 102). in addition — as the display of the key chosen — others — "— others — it sends also to people — " — etc. — other displays are sufficient. When a member setup is not chosen (step 102; N), a return is carried out to the main routine by the control program 254. On the other hand, when a setup is chosen an eye case (step 102; Y), the data-processing section 201 acquires the candidate list of members from a data storage

field, and displays it on a display 206 (step 104). Drawing 17 is a thing showing an example of the display screen displayed on a display 206 in this operation gestalt, and (a) expresses the e-mail screen transmitted to the user by whom, as for the destination transmitting member setting screen where the candidate list of members was displayed, and (b), the new member setting screen was set up by others, and, as for (c), the destination was set up. As shown in drawing 17 (a), the user list of destination configurator proper is expressed as a destination transmitting member setting screen. That is, the others concerned when the others perform the others concerned at the time of performing a destination setup to the others in the past and their destination, and the others who did a member setup separately are registered into data storage field 202B as a destination transmitting member candidate. This candidate list of members registered is displayed. And as shown in drawing 17 (a), a user name and user ID are displayed on a destination transmitting member setting screen, and the thing for which an applicable display part is touched by displaying a number before each user name and specifying this number with a ten key etc. — or finishing [selection within the limit on the left-hand side of the selected user name] when a user name is chosen by carrying out the inverse video of the applicable display part, and choosing it by actuation of a cursor movement key etc. — it is — the check mark (it expresses as a RE point) showing things is displayed.

[0098] Thus, a destination configurator chooses the member who sets up the destination in a destination transmitting member setting screen. When the member is not displayed on the member candidate by whom it is indicated by current, other member candidates are similarly displayed by choosing "0 Degree screen" similarly. And in choosing the new member who is not registered into the member candidate list of destination configurators, it chooses "## new member" key illustrated to drawing 17 (a). The data-processing section of Personal Digital Assistant 200 will display the new member setting screen shown in drawing 17 (b) on a display 106, if selection of this "## new member" key is detected (step 105;Y) (step 106). A destination configurator specifies the new member who sets up the destination in this new member setting screen. It is not necessary to input these all item, and as an input item for specifying a new member, although there are ID of the new member concerned, a name, a mail address, the telephone number, and a recitation number, since a member (user) is specified in an information centre 10, this operation gestalt requires the input of ID and at least two item of one item of others. However, in order to perform user qualification to accuracy more, you may make it require three items or more, four items or more, or all items. Moreover, the input of only one item is accepted, and when user specification cannot be carried out, you may make it this one item require the input of other items.

[0099] In the above destination transmitting member setting screen or a new member setting screen, if "* decision" key is chosen by the destination configurator after choosing a destination transmitting member, the data-processing section will detect this (step 107;Y), and will transmit a destination transmitting member's ID chosen at the time of decision to an information centre 10 (step 108). In addition, when a new member setup is carried out, other items inputted with ID are transmitted collectively. Moreover, the set-up new member is automatically registered into the user candidate list to a destination configurator.

[0100] Drawing 18 is a flow chart showing the destination setting processing of this operation gestalt performed in an information centre. The data-processing section 14 of an information centre 10 performs processing to storing (steps 36, 38, and 39) of the listening watch (step 31) of the user destination — the car destination. Each processing of these steps 31-39 is the same as that of steps 31-39 of destination judging processing explained by drawing 8 . after the above processing and the data-processing section 14 — the destination — or if it checks whether Member ID has been transmitted behind the destination and there is a member ID (step 120;Y), the car destination and the last destination are stored in each member's ID user data 50 (step 121).

[00100] And to each member's ID user, the data-processing section 14 carries out automatic creation of the mail of a purport with which the destination was set up by the others from the user data 50 about a destination configurator, and data, such as a received destination, and transmits (step 122). When transmitting e-mail, the mail address stored in the user data 50 of Relevance ID is used. Drawing 17 (c) illustrates that of the mail which the data-processing section 14 creates. The name of a destination configurator is used for the part of the "Takahashi ##" of the 1st line so that it may be illustrated by this drawing 17 (c). Start time is used for the part of the time of the 3rd line, a destination name is used for the part of the location of the 4th line, "##" of a destination configurator is used for the part of "Takahashi" of the 5th line, the car current position of user data is used and, as for the "house" of eye said 5 lines, start time is used at the ETD of the 6th line. Moreover, the publication below the "detail" of a last line is URL (Uniform Resource Locators) for acquiring an object file and displaying into a web browser. The user (a receiver may be personal computer and navigation equipment 100 grade in addition to gestalt information terminal 200.) who received e-mail from the information centre 10 can edit for himself the contents of a setting of the destination which others (drawing 17 (c) Takashi Takahashi) set up by specifying this URL. For example, when putting other member shells in the middle of between the set-up destinations, it becomes possible to set up the house of the member shell concerned as a shunt. Thus, the data relevant to the destination edited for [concerned] users after specifying URL displayed on e-mail are stored in the user data 50 of the edited relevance ID by the information centre 10.

[0101] After transmitting e-mail to each member's ID user, the data-processing section 14 judges whether the new member to a destination configurator is set up (step 123). If it attaches for whether being a new member, it judges from whether the member ID who is not in the member candidate list stored in the user data 50 corresponding to ID of a destination configurator is received. And when the new member is set up (step 123;Y), the data-processing section 14 stores a new member's name and ID in the member candidate list of destination configurators (step 124), and they carry out a return to the main routine by the control program 254.

[0102] By the above processing, the user (it considers as User B) to whom the destination was set by the others can check that the destination is set up by checking self-addressed mail. And this user B is carrying out ignition-on of the destination like the case it presetting to an information centre 10, by oneself on the day which the others' set up, destination setting check processing (drawing 9), and a request and path guidance processing (drawing 12) in which it explained with the 1st operation gestalt are perform, and if the car destination and the car destination are another points, the map picture of a non-car path will be further receive by Personal Digital Assistant 200. Thus, according to the 2nd operation gestalt, the destination to two or more members including self can be registered into the user data 50 of an information centre 10 by one destination setup by one person's destination configurator.

[0103] In addition, when there is a member who was not able to do e-mail transmission, it may make notify that there is a member who was not able to carry out e-mail transmission, and Member ID and a name to Personal Digital Assistant 200 or the navigation equipment 100 which carried out a destination setup, although the mail illustrated to drawing 17 (c) to each member ID who received the information centre 10 in the explained 2nd operation gestalt is transmitted (a modification 21). In the Personal Digital Assistant 200 grade which received this, the member's name and ID are displayed that the member who was not able to carry out e-mail transmission exists on a display. By checking this display, a destination configurator can inform the member concerned that a destination setup was carried out or that it was not able to carry out e-mail transmission, the means, for example, the telephone, other than e-mail.

[0104] Moreover, although it was made to store in a user's 50 same area with the explained 2nd operation gestalt, without distinguishing at the destination which others set up, and the destination which self set up, both are distinguished and you may make it store in another area (modification 22). In this case, an information centre 10 is checked about that it is the destination which others set up to the user who searched for the destination setting check, and whether the path and guidance data to that destination (car destination) may be transmitted, when the destination set up when performing destination setting check processing is set up by others. An information centre 10 performs path planning and guidance data transmitting processing (drawing 11), when the check of the purport as which the destination which others set up is sufficient is transmitted from navigation equipment 100.

[0105] (4) the 3rd operation gestalt — explain the 3rd operation gestalt below. The user of Personal Digital Assistant 20 enabled it to reach to the last destination by on foot etc. because an information centre 10 searches the non-car path from the car destination to the last destination with the explained 1st operation gestalt and transmits a map picture to Personal Digital Assistant 20 with it. Independently [this], from the current position of Personal Digital Assistant 200 which is presetting the destination in addition to the 1st operation gestalt, the 3rd operation gestalt is searched for the non-car path to the current position of a car in which navigation equipment 100 is mounted, and a map picture is transmitted to Personal Digital Assistant 200 concerned with it. In addition, it is possible to include in destination setting processing performed in advance, also when presetting to coincidence, the destination of other users who explained with the 2nd operation gestalt, and.

[0106] Drawing 19 expresses an example of an exchange of the data of the information centre 10 in this operation gestalt, and a navigation system 100 and Personal Digital Assistant 200. As shown in arrow-head E0' of this drawing 19, Personal Digital Assistant 200 sets up the current position while setting up the destination by actuation explained with the 1st operation gestalt. When, as for the setup of the current position, Personal Digital Assistant 200 is equipped with the GPS receiving set, the coordinate value specified at the LAT specified with the GPS receiving set and LONG is set up as the current position. When it does not have the location measurement sections, such as GPS, the address and the telephone number of the location which are inputted by the user (destination configurator) are set up as the current position. Moreover, if it is Personal Digital Assistant 200 equipped with the data 266 for destination setup, the facility which is like the destination setting processing by the destination setting program 250 now will be specified from the data 266 for a destination setup, and this will be set up as the current position. After the destination setting program in this case specifies a facility etc. that the 1st operation gestalt explained by a genre etc. similarly, it is made to decide as any to set it between the destination, the course ground (shunt), and the current position by choosing "setting it as the destination", "setting it as the course ground" or, and "setting it as the current position." Furthermore, as Personal Digital Assistant 200 shows drawing 7, when the browser software of WWW performs a destination setup to an information centre 10 via the Internet, the current position is set up by specifying the facility which is via the Internet similarly now.

[0107] Personal Digital Assistant 200 will transmit the destination, the current position, and ID which were set up to an information centre 10, if the destination and the current position are set up by one of the above approaches as arrow-head E1' of drawing 19 shows. In an information centre 10, if data, such as a destination, are received, as arrow-head E2' shows, it judges whether the current position of Personal Digital Assistant 200 is included in the received data, and if not contained, destination judging processing (drawing 8) is performed like the 1st operation gestalt, and the last destination and the car destination are stored in the user data 50 of Relevance ID.

[0108] On the other hand, when the current position is included in received data, it is judged as a thing with the moving trucking retrieval demand to the car destination, and user data 50 empty-vehicle both the current positions corresponding to ID which received are read, and the path planning to current position empty vehicle both the current positions of Personal Digital Assistant 200 which received is performed in non-car mode. That is, the data-processing section 14 of an information centre 10 uses the data 42 for path planning including exclusive pedestrian roads used by retrieval in non-car mode, such as a footbridge and a zebra zone, a car, or the data (a name of the station, point data, distance between points, Kursbuch, etc.) about the movable path by migration means other than a walk (a cable car, a monorail, a ropeway, an electric car, a train, a ship, a bus, a taxi, moving walk, etc.), and

searches for the moving trucking to current position empty vehicle both the current positions. And according to the moving trucking to the searched last destination, the data-processing section 14 of an information centre 10 uses the map picture of the map picture creation data 54, creates moving trucking with the map picture illustrated by drawing 14 and drawing 15, and as arrow-head E3' shows, it transmits the guidance data based on the map picture to the created car destination to Personal Digital Assistant 200. With Personal Digital Assistant 200 which received the map picture, the path by the non-car means to the car destination is guided by carrying out image display of the received map picture one by one according to actuation of a user (E4').

[0109] In addition, it is necessary to enable it to always recognize the car current position in the information centre 10 in the 3rd operation gestalt. Therefore, navigation equipment 100 acquires the car current position from the location measurement section 104 at the time of ignition-off of a car, and transmits it to an information centre 10. In an information centre 10, it becomes possible to always recognize the current position of a car by storing the car current position transmitted in the user data of Relevance ID.

[0110] Thus, according to the 3rd operation gestalt, the user of Personal Digital Assistant 200 can arrive at the car current position easily by receiving the map picture to current position empty vehicle both the current positions while setting up the destination for navigation equipment 100. Thus, since the map picture (non-car moving trucking) to the car current position is receivable, even when you go to an unfamiliar location, from a car, it can get used and move in comfort.

[0111] Although Personal Digital Assistant 200 was replaced with the retrieval demand of moving trucking in the explained 3rd operation gestalt and the current position was transmitted to the information centre 10, you may make it transmit the requested data of the moving trucking retrieval to the car current position to an information centre 10 with the current position (modification 31). In this case, in an information centre, moving trucking retrieval by the non-car mode to the car current position will be performed by receiving the requested data of moving trucking retrieval with the current position of Personal Digital Assistant 200.

[0112] Moreover, although the explained 3rd operation gestalt explained the case where the destination for navigation equipment 100 was set up in advance from Personal Digital Assistant 200 to the example, with regards to the existence of a destination setup for the navigation equipments 100, it may be made to search for the moving trucking there is nothing and according to the non-car mode to current position empty vehicle both the current positions of Personal Digital Assistant 200 (modification 32). In this case, Personal Digital Assistant 200 transmits the current position which served as the demand of the non-car moving trucking retrieval to the current position and the car current position, or the demand of the non-car moving trucking retrieval to the car current position to an information centre 10. On the other hand, without performing destination judging processing (drawing 8), when the current position which served as the demand of the non-car moving trucking retrieval to the current position and the car current position or the demand of the non-car moving trucking retrieval to the car current position is received, an information centre 10 creates a map picture with retrieval of the non-car mode moving trucking to current position empty vehicle both the current positions mentioned above, and transmits it to Personal Digital Assistant 200.

[0113] Furthermore, the facilities and points other than the car current position are made into the destination of Personal Digital Assistant 200, and you may make it search for the moving trucking to this destination in non-car mode (modification 33). In this case, Personal Digital Assistant 200 transmits the demand (the current position may make this demand serve a double purpose) of the destination, the data in which it is shown that the destination is a destination of Personal Digital Assistant 200, the current position, and moving trucking retrieval with non-car mode to an information centre. A setup of the destination by Personal Digital Assistant 200 is based on either of the all directions methods explained with the 1st operation gestalt. In an information centre 10, without performing destination judging processing (drawing 8), a map picture is created with retrieval of the non-car mode moving trucking to current position empty vehicle both the current positions mentioned above, and it transmits to Personal Digital Assistant 200.

[0114] (5) the 4th operation gestalt — explain the 4th operation gestalt below. When getting down from the car which arrived at the car destination and going to the destination on foot etc., a car (navigation equipment 100) notifies the car current position to the arrival time of the car destination in an information centre 10, and he is trying for a server to transmit the simple map (map picture) to the last destination to a cellular phone with the explained 1st operation gestalt based on it. However, if it is the place which the electric wave for the communication link of the point of arrival (usually car destination) of a car of a basement car park etc. does not reach, navigation equipment 100 may be unable to notify the car current position and car destination arrival to an information centre 10. With the 4th operation gestalt, when a communication link is impossible with an information centre 10 in a car point of arrival final in this way, the car current position is transmitted to Personal Digital Assistant 200, and after moving to the point which can communicate, arrival and the car current position of a car are transmitted to an information centre 10 from Personal Digital Assistant 200.

[0115] Drawing 20 expresses an example of an exchange of the data of the information centre 10 in the 4th operation gestalt, and a navigation system 100 and Personal Digital Assistant 200. The processing which sets the destination of navigation equipment 100 as an information centre 100 from Personal Digital Assistant 200 (arrow heads E0-E2), And ignition-on (arrow head F0) of the car carrying navigation equipment 100 or subsequent ones Destination setting check processing (arrow heads F1-F4; drawing 9 , drawing 10), and the request (navigation equipment 100) of a division path and processing (arrow heads F5-F9, —) of transmission (information centre 10) of a path and guidance data are the same as that of the 1st operation gestalt.

[0116] And when navigation equipment 100 arrives at the destination and data transmission is not made in an information centre 10, as arrow-head Fn-2' of drawing 20 shows, the data-processing section of navigation equipment 100 transmits the car current position measured in the location measurement section 104 to Personal Digital Assistant 200. Transmission of this car current position is based on either wire communications, such as radio, such as infrared ray communication and SS (spectrum diffusion) communication link, serial communication, and a parallel communication link, a packet switching system or a circuit switching mode. When the communication link with an information centre is based on a packet switching system and the car current position is transmitted to Personal Digital Assistant 200, on the other hand, a target is made to end the communication link with an information centre 10 with navigation equipment 100.

[0117] If navigation equipment 100 empty-vehicle both the current positions are received, Personal Digital Assistant 200 stores the received car current position in data storage field 202B, as shown in arrow-head Fn-1' of drawing 20. And after a user carries Personal Digital Assistant 200, separates from a car and moves to the location in which the communication link with an information centre 10 is possible, as shown in arrow-head Fn', he notifies the car current position, ID, and car destination arrival to an information centre 10 from Personal Digital Assistant 200.

[0118] On the other hand, an information centre 10 is searched for the moving trucking by non-car mode from the car current position to the last destination, while storing the car current position in the user data 50 of Relevance ID as an arrow head G0 shows if Personal Digital Assistant empty vehicle both the current positions, ID, and car destination arrival are received. Retrieval of this moving trucking is the same as the last destination retrieval processing (drawing 13) in which it explained in the 1st operation gestalt. And as shown in an arrow head G1, the map picture created by the last destination retrieval processing is transmitted to Personal Digital Assistant 200. In addition, when the communication link with navigation equipment 100 is based on a packet switching system and Personal Digital Assistant 200 empty-vehicle both the current positions etc. are received, on the other hand, a target is made to end a communication link in an information centre 10.

[0119] Personal Digital Assistant 200 which received the map picture from an information centre 10 to the last destination performs guidance to the last destination by displaying a map picture on a display 206 like the 1st operation gestalt, as shown in an arrow head G2.

[0120] Drawing 21 expresses the request and path guidance processing in the 4th operation gestalt. As shown in this drawing 21, the processing from step 80 to step 85 of the request and path guidance processing in the 4th operation gestalt is the same as that of the 1st operation gestalt (refer to drawing 12). And when a car arrives at the car destination (step 85;Y), it judges whether the communication link with an information centre 10 is possible for the data-processing section 101 of navigation equipment 100 (step 130), and if the communication link is possible (step 130;Y), like the 1st operation gestalt, it will transmit to an information centre 10 (step 86), and the return of having arrived at the car current position and the car destination will be carried out to the main routine by the control program 154. On the other hand, when the communication link with an information centre 10 cannot be performed, the data-processing section 101 transmits the car current position measured in the location measurement section 104 to Personal Digital Assistant 200, and it ends the communication link with an information centre 10 compulsorily (step 131), and it carries out a return to a main routine.

[0121] As explained above, according to the 4th operation gestalt, the Personal Digital Assistant which is not equipped with current position detection equipments, such as a GPS receiving set, can also acquire the current position (car current position). The car current position acquired from this navigation equipment 100 can be used as the current position of Personal Digital Assistant 200 in the modification 33 of the 3rd operation gestalt (modification 41). This Personal Digital Assistant 200 requires moving trucking with the map picture from the current position (= car current position) to the destination (destination where it moves with a non-car means) of arbitration of an information centre 10.

[0122] With the 3rd operation gestalt, although the car current position was transmitted to the information centre 10 from navigation equipment 100 in ignition-off, the 4th operation gestalt is applicable also to this 3rd operation gestalt (modification 42). That is, when the communication link with an information centre 10 cannot be performed in the case of ignition-off, navigation equipment 100 transmits a car current status to Personal Digital Assistant 200. And a user transmits the car current position to an information centre 10 from Personal Digital Assistant 200, after moving to the location which can communicate. Even if it is the case where ignition-off is carried out by this in the area where a car cannot communicate, an information centre 10 can store and recognize the car current position.

[0123] Moreover, although navigation equipment 100 transmitted the car current position to Personal Digital Assistant 200 with the 4th operation gestalt when it arrived at the car destination etc., it is timing required for fixed spacing (for example, every [every 5 minutes and n minutes (every etc.) (n is the natural number which can be changed)] etc.), or you may make it always transmit the car current position to Personal Digital Assistant 200 according to a demand of a user (modification 43). the timing which made a course change of the timing which ran predetermined distance (for example, 100m, 200m, 500m, etc.), the crossing, etc. as required timing, for example, and ignition — there is off timing etc. In this case, also when parking a car in the middle of a transit path temporarily and you go out to the specific destination (destination where it moves with a non-car means), it can be used as the current position (= car current position) of Personal Digital Assistant 200 in a modification 33. In addition, each modification of the 4th operation gestalt including this modification 43 can be applied when path guidance by navigation equipment 100 is omitted (modification 44).

[0124] (6) the 5th operation gestalt — explain the 5th operation gestalt below. Navigation equipment 100 is equipped with a display 106, and he is trying to express a setup of the destination, the transit path for path

guidance, and the current position as the explained 1st operation gestalt from this display 106. Moreover, with the 1st operation gestalt, the personal digital assistant is used for reception and the object for a display of non-car moving trucking (map picture) in order to set the destination as an information centre 10, and it is not used for the display of the transit path of a car. On the other hand, it connects with navigation equipment 100 and enables it to use Personal Digital Assistant 200 as a part of/or display, and input section as the display and the input section of navigation equipment 100 by the cable or wireless with the 5th operation gestalt.

[0125] Thus, by using the display capabilities and/or the input function of Personal Digital Assistant 200 as some navigation equipments 100, navigation equipment 100 can be considered as a cheap configuration, or can carry out expansion. That is, the configuration of the input section of navigation equipment 100 can be simplified by making the indicating equipment of navigation equipment 100 unnecessary by using Personal Digital Assistant 200 as an indicating equipment, and using Personal Digital Assistant 200 as some input devices. Moreover, a display function is extensible by using the display function of Personal Digital Assistant 200 with the navigation equipment 100 which has an indicating equipment.

[0126] It is using the display 206 of Personal Digital Assistant 200 with navigation equipment 100, and the various data for a display are outputted from navigation equipment 100, and it is made to specifically display on the display (display 206) of Personal Digital Assistant 200. For example, although it changes and displays on a crossing map from the map screen it was being displayed till then that reached near the crossing for guidance (for example, 200 this side) or the crossing map is displayed on some screens Only a crossing map can be displayed on the display 206 of Personal Digital Assistant 200 where a map screen is displayed on the display 106 of navigation equipment 100 as it was by using the display screen of Personal Digital Assistant 200. Moreover, even if it is a user without the mounted display for navigation equipment 100 (display 106), a map can be seen by the display 106 of navigation equipment 100 also during a menu display according to making the display 206 of Personal Digital Assistant 200 display various selectable menus on the pan which can see the map (path map) of navigation only with Personal Digital Assistant 200 with navigation equipment 100. On the other hand, when using the input section of Personal Digital Assistant 200 with navigation equipment 100, the interface for an input becomes unnecessary at navigation equipment 100 by transmitting the signal from Personal Digital Assistant 200 to navigation equipment 100 by communication link.

[0127] In the case of this 5th operation gestalt, Personal Digital Assistant 200 and navigation equipment 100 are equipped with the buffer for the data transceiver section and data transmission and reception of dedication or the communications control section 208, and 108 combination, respectively. As for the both data transceiver section, communication interfaces, such as wire communications, such as radio, such as infrared ray communication (IrDA specification, IrTran-P specification, etc.) and SS (spectrum diffusion) communication link, serial communication, and a parallel communication link, are arranged. Moreover, when the cellular phone is used as Personal Digital Assistant 200, the message by handsfree is constituted possible and an initial screen format can be safely talked over the telephone with handsfree also in a display at a display 206. In addition, the navigation equipment 100 of the 5th operation gestalt is equipped with the path probe ability to the destination, and explains the case where it has the path planning program for it and the data for path planning, and data for guidance. Moreover, Personal Digital Assistant 200 of the 5th operation gestalt does not have data for a destination setting program and a destination setup, and explains the case where it does not have the function to set up the destination independently.

[0128] Next, intermediary explanation is given at the actuation in the 5th operation gestalt. Drawing 22 is a flow chart showing actuation of the destination setting processing by Personal Digital Assistant 200. The data-processing section of Personal Digital Assistant 200 displays a mode selection screen on a display 206 (step 141). That is, the data-processing section 201 displays the "NABIME new" key which chooses as each Personal Digital Assistant 200 the function of the "iMode" key which is the data communication menu which sets up specific data communication as illustrated by drawing 23 (a), the "telephone menu" key which chooses a telephone function, and this operation gestalt etc. as a mode selection screen of a proper on a display 206. Moreover, if Personal Digital Assistant 200 is a cellular phone and it is an electronic notebook about a "telephone menu" key, a "data communication menu" key, etc. other than a "NABIME new" key, a "schedule" key, a "address book" key, etc. will be displayed on a display 206 other than a "NABIME new" key. Although these mode selection keys were explained as a softkey by which a screen display was carried out, they may be hardkeys, such as a switch.

[0129] In a mode selection screen, the data-processing section 201 of Personal Digital Assistant 200 will start the navigation equipment 100 which minds an interface, is supplied in it and connected in the seizing signal, if NABIME nu is chosen (step 141;Y) (step 143). And the data-processing section 201 transmits the demand signal of NABIME nu, and displays the NABIME nu which acquired and (step 144) acquired NABIME nu on a display 206 from navigation equipment 100 (step 145). it is illustrated by drawing 23 (b) in this Nabih menu screen — as — "— 1. —" key which determines a destination — "— 2. — a screen display of the key for choosing the various actuation to look for, such as " key and a "setting [3.]" key, is carried out. Each of these keys are selectable softkeys by software, and after [which shifted and specified that key] carrying out a screen display by the scrolling key, or after specifying the number displayed before each key with a ten key, a key is chosen by carrying out the depression of the selection carbon button.

[0130] If the key "determines a destination" in the Nabih menu screen is chosen (step 146;Y), the data-processing section 201 will transmit the demand signal of a destination list, will acquire a destination list from navigation equipment 100 (step 147), and will display a destination list on the display 206 of Personal Digital Assistant 200 (step 148). And if selection of the destination by the configurator is supervised and it decides (step 149;Y), the

data-processing section 201 will transmit the settled destination (shunt when [And] chosen) to navigation equipment 100 (step 150), will turn ON NABIFURAGU (step 151), and it will carry out a return to the main routine by the control program 254.

[0131] Drawing 24 expresses the routing processing by the navigation equipment 100 in the 5th operation gestalt. If the data-processing section 101 of navigation equipment 100 is supervising that the destination is transmitted from Personal Digital Assistant 200 and the destination is acquired (step 161;Y), it will acquire location measurement section 104 empty-vehicle both the current positions (step 162). And it searches for the transit path from the acquired car current position to the destination, and stores in the path guidance data 160 of data storage field 102B (step 163). In addition, when navigation equipment 100 is equipped with the destination judging processing (drawing 8) function, when the destination is received from Personal Digital Assistant 200, the car destination and the last destination are judged, and routing processing of drawing 24 is searched for the path to car current position empty vehicle both destinations. After path planning is completed, the data-processing section 101 sets the routing flag showing path planning ending (step 164), and it carries out a return to the main routine by the control program 154.

[0132] Drawing 25 is a flow chart showing the processing which transmits path guidance data from navigation equipment 100. The data-processing section 101 of navigation equipment 100 checks from a routing flag whether path planning is completed, and, in flag-on (step 171;Y), acquires the car current position from the location measurement section 104 (step 172). And if it judges whether the data-processing section 101 has guidance data which should be transmitted to Personal Digital Assistant 200 and there are guidance data which should be transmitted (step 173), guidance data will be transmitted to Personal Digital Assistant 200 (step 174). As data transmitted to Personal Digital Assistant 200, there are the car current position, a map, a crossing enlarged drawing, a transit path, etc.

[0133] The routing flag set up at step 164 of routing processing while transmitting OFF of NABIFURAGU to Personal Digital Assistant 200, when path guidance data were transmitted to Personal Digital Assistant 200 timely until, as for the data-processing section 101 of navigation equipment 100, the car arrived at the destination and path guidance was completed (step 175; N), the car arrived at the destination and path guidance was completed (step 175;Y) is cleared, and a return is carried out to a main routine.

[0134] Drawing 26 is a flow chart showing processing of Personal Digital Assistant 200 which displays the guidance data acquired from navigation equipment 100 on a display 206. The data-processing section 201 of Personal Digital Assistant 200 supervises transmission of the guidance data from navigation equipment 100 (step 181). The data-processing section 201 will display guidance data, such as the received car current position, a map, a crossing enlarged drawing, and a transit path, on the screen of a display 206, if guidance data are received (step 181;Y) (step 182). In addition, the data-processing section 201 can make guidance data easy to recognize by making a back light turn on if needed [such as night,], when displaying guidance data. If the data-processing section 201 continues reception and a display of this guidance data until a car arrives at the destination and directions of NABIFU lug-off are transmitted from navigation equipment 100 (step 183; N), and directions of NABIFU lug-off are received (step 183;Y), it will turn OFF NABIFURAGU (step 184) and it will carry out a return to a main routine.

[0135] Drawing 27 expresses the screen for path guidance displayed in the 5th operation gestalt. Drawing 27 (a) expresses the outline of the initial screen format displayed when navigation equipment 200 is equipped with the display 206, and the car location M and the transit path L are displayed on the map screen. And as shown in drawing 27 b, it is transmitted as guidance data and arrow-head B-2 the distance B1 and the course modification direction of [by the next guidance crossing] indicate [the car location of a degree] the modification direction to be to Personal Digital Assistant 200 from navigation equipment 100 beyond predetermined distance (for example, 500m, 700m, 1 etc.km, etc.) in a certain case is displayed till a guidance crossing. In drawing 27 (b), distance B1 and course modification direction arrow-head B-2 are displayed so that 2km beyond may be turned to the right. As the distance by the guidance crossing shows beyond predetermined distance at drawing 27 (b) in a certain case, distance B1 and course modification direction arrow-head B-2 are displayed, and neither a transit path nor a landmark is displayed. And if the distance by the guidance crossing turns into under predetermined distance, the crossing enlarged drawing with which arrow-head B4 displayed in accordance with the map screen B3 and the transit path is displayed will be transmitted and displayed on Personal Digital Assistant 200 from navigation equipment 100 so that it may be illustrated by drawing 27 (c). Although not displayed on drawing 27 (c), a landmark etc. is suitably displayed on a crossing enlarged drawing.

[0136] Next, when the cellular phone is used as this Personal Digital Assistant 200, processing when arrival of the mail is during path guidance is explained with reference to the flow chart of drawing 28 . When it supervises whether the data-processing section 201 of a cellular phone (Personal Digital Assistant 200) has the arrival of a telephone and there is arrival of the mail (step 191;Y), it judges whether NABIFURAGU is turned on or not (step 192). When there is no arrival of the mail (step 191; N), and in [although there is arrival of the mail,] being NABIFU lug-off (step 192; N), it carries out a return to a main routine. When NABIFURAGU is ON (step 192;Y), displaying Personal Digital Assistant 200 is continued without changing the map of the guidance data transmitted [be / it / under / message / including] from navigation equipment 100, and it outputs the ringer tone for a handsfree message (step 193). And when the switch for a handsfree message is turned on or after [arrival of the mail] fixed time amount progress is carried out (step 194;Y), the data-processing section 201 starts the message by handsfree (step 195). Since Personal Digital Assistant 200 is connected to navigation equipment 100 by the cable and it is fixed in a car (fixed to the location which can communicate in the case of radio), the handsfree unit of dedication is used or a mounted microphone and a loudspeaker are used as a handsfree unit. If a message is continued and a message is

completed by selection of a message end key etc. until the message by handsfree is completed (step 196; N) (step 196;Y), the return of the data-processing section 201 will be carried out to a main routine.

[0137] In addition, although the explained 5th operation gestalt explained the case where set up the destination (a shunt is included) and it transmitted to navigation equipment 100 Personal Digital Assistant 200 like the 1st operation gestalt A parking lot demand (when navigation equipment 100 has the destination judging processing (drawing 8) function) and/or start time are set up (when performing a prior destination setup to navigation equipment 100), and you may make it transmit to navigation equipment 100 (modification 51).

[0138] Moreover, although the case where the explained navigation equipment 100 of the 5th operation gestalt was equipped with the path probe ability to the destination, and Personal Digital Assistant 200 was not equipped with the independent destination setting up function was explained, navigation equipment 100 is not equipped with path probe ability, and/or you may make it Personal Digital Assistant 200 equipped with an independent destination setting up function like the 1st operation gestalt. For example, when there is no path probe ability in navigation equipment 100 and it performs path planning etc. in an information centre 10, Personal Digital Assistant 200 transmits the set-up destination (by the case, they are a shunt, a parking lot demand, and start time), and ID of navigation equipment 100 to an information centre 10 (modification 52). In this modification 52, an information centre 10 stores the received destination (car destination) in the user data 50 of Relevance ID. And destination judging processing (drawing 8) and destination check judging processing (drawing 9 , drawing 10) are performed like the 1st operation gestalt. After that, an information centre 10 is searched for the transit path to the car destination, and it transmits to direct navigation equipment 100 via Personal Digital Assistant 200 in it. In this case, all the transit paths to the car destination are sufficient as the transit path transmitted to navigation equipment 100, and the division path according to the request from navigation equipment 100 as well as the 1st operation gestalt is sufficient as it. It is transmitted to Personal Digital Assistant 200 from navigation equipment 100, and all the received transit paths or a division path, and the guidance data according to the car current position are displayed on the display 206 of Personal Digital Assistant 200.

[0139] Furthermore, when performing a prior destination setup explained with the 1st operation gestalt to an information centre 10, you may make it transmit the set-up destination to an information centre 10 irrespective of the existence of the path probe ability of navigation equipment 100.

[0140] (7) the 6th operation gestalt — explain the 6th operation gestalt below. With this 6th operation gestalt, point retrieval, path retrieval, a travel schedule setup, etc. are performed, a user moves with guidance of the navigation equipment 100 mounted to the parking lot of the destination neighborhood etc., and an information centre 10 is applied to the system (seamless navigation system) guided from there to the destination using Personal Digital Assistant 200, for example. Although the case where Personal Digital Assistant 200 was used between navigation equipment 100 in the 5th operation gestalt and each modification from the 1st operation gestalt, connecting by wireless or the cable was explained, when a user moves out of a vehicle with Personal Digital Assistant 200, with the 6th operation gestalt, the fault by forgetting to transmit required data to Personal Digital Assistant 200 is canceled in each [these] operation gestalt and a modification.

[0141] The navigation equipment 100 in this 6th operation gestalt is equipped with the communication device by wireless or a cable with Personal Digital Assistant 200, and the location supplement equipment (location supplement means) supplementary to the location of Personal Digital Assistant 200. Personal Digital Assistant 200 is equipped with the communications control section 208 which carries the communication link between an information centre 10 and navigation equipment 10 by mobile communications, such as a communication device with the web browser software and the navigation equipment 100 which display various information, and a cellular phone.

[0142] Drawing 29 is the flow chart with which the navigation equipment 100 in the 6th operation gestalt expressed the processing actuation supplementary to the location of Personal Digital Assistant 200. The data-processing section 101 of navigation equipment 100 supervises a personal digital assistant (step 201), and judges whether it is the place where Personal Digital Assistant 200 moves out of an empty vehicle in the car (step 202). That is, it is recognized as the processing unit 101 of navigation equipment 100 computing the distance of Personal Digital Assistant 200, and it "moving out of a vehicle" by exchanging the data for localization with Personal Digital Assistant 200 periodically, when it separates from a fixed distance decided beforehand when wireless connection of Personal Digital Assistant 200 is made by infrared ray communication etc. The data containing identification code are transmitted and received, and as data for these localization, also in order that both sides may identify each, the distance of Personal Digital Assistant 200 is computed by the variation of the reinforcement of that electric wave (infrared radiation), or reinforcement etc. In addition, you may make it exchange the field strength and the error rate other than identification code, and a detailed data format will apply to the data communication specification used among both. Moreover, it is recognized as the data-processing section of navigation equipment 100 "moving out of a vehicle" by detecting that the cable connection was canceled, when Personal Digital Assistant 200 is connected with navigation equipment 100 with the cable for charge or electric supply.

[0143] If migration out of the empty vehicle of Personal Digital Assistant 200 in the car is detected (step 202;Y), the data-processing section 101 will acquire the current position from the location measurement section 104 (step 203), will transmit specific data to Personal Digital Assistant 200 (step 204), and they will carry out a return to the main routine by the control program 154. Navigation equipment 100 transmits the map data of the car current position or the car current position, and the car current position etc. to Personal Digital Assistant 200 by wireless as specific data here. In addition, you may make it transmit the car current position also to an information centre 200 through Personal Digital Assistant 200 according to selection actuation or an option setup set up beforehand of a user.

[0144] Thus, un-[that the car current position etc. cannot be transmitted to an information centre 10 after reaching to the location where a user can communicate, since the car current position is surely stored in Personal Digital Assistant 200 when it is applying this operation gestalt to the 1st operation gestalt, for example since Personal Digital Assistant's 200 surely acquires the car current position automatically and it stores in a data storage field and an information centre 10 and navigation equipment 100 cannot communicate] arranging is avoided.

Moreover, when requiring moving trucking retrieval in the non-car mode to a car of an information centre 10 after separating from a car since the car current position is surely automatically stored in Personal Digital Assistant 200 when separating from a car, even if it is unfamiliar land, the car current position [finishing / storing] can be transmitted to an information centre 100 as the last destination of non-car mode moving trucking retrieval, and he feels easy, and you can separate from a car. The current position transmitted to an information centre 10 from Personal Digital Assistant 200 is set up by the facility name in the case of being now, the telephone number, the address, etc.

[0145] As explained above, according to the 6th operation gestalt, the actuation burden of the data transfer by the user is mitigable by transmitting the present car current position without special actuation of a user to Personal Digital Assistant 200 automatically using wireless. moreover, before transmitting the data which tend to happen by cable connection, the thing out of which it comes canceling connection and performing a data transfer, which it hears and to become is prevented.

[0146] It is possible to constitute from a 6th operation gestalt explained above as follows.

It has mounted equipment and a Personal Digital Assistant. (A) Said mounted equipment Whether said Personal Digital Assistant is going to move out of an empty vehicle in the car with a judgment means to judge, and said judgment means When judged with said Personal Digital Assistant moving out of an empty vehicle in the car, it has a transmitting means to transmit specific data to said Personal Digital Assistant. Said Personal Digital Assistant Car data processing system characterized by having a receiving means to receive a store and the specific data transmitted by said transmitting means, and to store in said store.

(B) Said judgment means is car data processing system given in (A) characterized by judging with the Personal Digital Assistant moving out of an empty vehicle in the car when the distance of said Personal Digital Assistant and car exceeds a threshold.

(C) Said judgment means is car data processing system given in (A) characterized by judging with said Personal Digital Assistant moving out of an empty vehicle in the car by having canceled connection by this cable, when said Personal Digital Assistant and car were connected by the cable for electric supply, or the cable for data communication.

(D) Said Personal Digital Assistant is car data processing system given in (A) characterized by having a processing means to perform specific processing with said receiving means using the data stored in said store, (B), or (C).

(E) It is car data processing system given in (D) characterized by for said specific data being car location data, and combining said specific processing with a map and displaying a car location on the screen of a Personal Digital Assistant.

[0147] (F) The mounted data processor characterized by having a judgment means to judge whether said Personal Digital Assistant is going to move out of an empty vehicle in the car, and a transmitting means to transmit specific data to said Personal Digital Assistant with said judgment means when judged with said Personal Digital Assistant moving out of an empty vehicle in the car. As a mounted data processor, navigation equipment is applied, for example.

(G) Said judgment means is a mounted data processor given in (F) characterized by judging with the Personal Digital Assistant moving out of an empty vehicle in the car when the distance of said Personal Digital Assistant and car exceeds a threshold.

(H) Said judgment means is a mounted data processor given in (F) characterized by judging with said Personal Digital Assistant moving out of an empty vehicle in the car by having canceled connection by this cable, when said Personal Digital Assistant and car were connected by the cable for electric supply, or the cable for data communication.

(I) Said specific data are a mounted data processor given in (F) characterized by being car location data, (G), or (H).

[0148] (J) The Personal Digital Assistant characterized by having a receiving means to receive a store and the specific data transmitted from the mounted data source in case it moves out of an empty vehicle in the car, and to store in said store.

(K) A Personal Digital Assistant given in (J) characterized by having a processing means to perform specific processing with said receiving means using the data stored in said store.

(L) Said specific processing is a Personal Digital Assistant given in (K) characterized by combining with a map and displaying a car location on the screen of a Personal Digital Assistant.

[0149] (8) the 7th operation gestalt — explain the 7th operation gestalt below. An information centre 10 performs point retrieval, path retrieval, a travel schedule setup, etc.. this 7th operation gestalt moves a user with guidance of the navigation equipment 100 mounted to the parking lot of the destination neighborhood etc., and it is applied to the system (seamless navigation system) guided from there to the destination using Personal Digital Assistant 200. Although it constituted from a 1st operation gestalt so that data, such as a destination where navigation equipment 100 was beforehand set up by ignition-on, might be acquired from an information centre 10, with this 7th operation gestalt, it detects the thing which Personal Digital Assistant 200 is going to move into a car from the outside of a car, or having moved, and the destination data beforehand registered into the information centre 10 are acquired

automatically.

[0150] The navigation equipment 100 in this 7th operation gestalt is equipped with the communication device by wireless or a cable with Personal Digital Assistant 200, and the location supplement equipment (location supplement means) supplementary to the location of Personal Digital Assistant 200. Personal Digital Assistant 200 is equipped with the communications control section 208 which carries the communication link between an information centre 10 and navigation equipment 10 by mobile communications, such as a communication device with the web browser software and the navigation equipment 100 which display various information, and a cellular phone. In addition, the navigation equipment 100 of this operation gestalt is not equipped with the communications control section 108 which communicates with an information centre 10 through Personal Digital Assistant 200, and communicates by the information centre 10 and independent.

[0151] Drawing 30 is the flow chart with which the navigation equipment 100 in the 7th operation gestalt expressed the processing actuation supplementary to the location of Personal Digital Assistant 200. The data-processing section 101 of navigation equipment 100 supervises a personal digital assistant (step 211), and judges whether it is the place where Personal Digital Assistant 200 moves into the empty vehicle outside a vehicle (step 212). That is, it is recognized as the processing unit 101 of navigation equipment 100 computing the distance of Personal Digital Assistant 200, and it "moving to in the car" by exchanging the data for localization with Personal Digital Assistant 200 periodically, when it approaches rather than a fixed distance decided beforehand when wireless connection of Personal Digital Assistant 200 is made by infrared ray communication etc. The data containing identification code are transmitted and received, and as data for these localization, also in order that both sides may identify each, the distance of Personal Digital Assistant 200 is computed by the variation of the reinforcement of that electric wave (infrared radiation), or reinforcement etc. In addition, you may make it exchange the field strength and the error rate other than identification code, and a detailed data format will apply to the data communication specification used among both. Moreover, it is recognized as the data-processing section of navigation equipment 100 "moving to in the car" by detecting that the cable connection was connected, when Personal Digital Assistant 200 is connected with navigation equipment 100 with the cable for charge or electric supply.

[0152] If migration into the empty vehicle outside a vehicle of Personal Digital Assistant 200 is detected (step 212;Y), the data-processing section 101 will acquire destination information [finishing / a setup] from an information centre 10 (step 213). That is, the data-processing section 101 is requested to acquire set up destination information from an information centre 10 to Personal Digital Assistant 200. Personal Digital Assistant 200 acquires set up destination information from an information centre 10 by this request, and it transmits to navigation equipment 100. The data-processing section 101 of navigation equipment 100 stores in data storage field 102B the set up destination information acquired from the information centre 10 through Personal Digital Assistant 200, and it carries out a return to a main routine.

[0153] The navigation equipment 100 which acquired set up destination information from the information centre 10 through Personal Digital Assistant 200 searches for the transit path to the destination acquired from the car current position, and performs transit guidance.

[0154] As explained above, according to the 7th operation gestalt, a user's destination setting actuation burden is mitigable without special actuation of a user by transmitting automatically the purpose information set up and saved beforehand in the information centre 10 to Personal Digital Assistant 200 using wireless. Moreover, it can prevent that it becomes impossible to perform the data transfer by a connection failure of the cable for data transfer etc., connection mistake, etc. which tends to happen by cable connection etc. Furthermore, since it is carried out in case the communication link which requires time amount most gets in an automobile, the transit path guidance by navigation equipment 100 etc. can be immediately started after entrainment.

[0155] In addition, with the operation gestalt explained above, although it had the communications control section 108 which navigation equipment 100 communicates with an information centre 10 through Personal Digital Assistant 200, and communicates by the information centre 10 and independent and the case, ****, was explained, navigation equipment 100 may be equipped with the communications control section 108 which communicates by the information centre 10 and independent (modification 71). In this case, the data-processing section 101 of navigation equipment 100 will acquire set up destination information from the direct information centre 10 through the communications control section 108, if migration into the empty vehicle outside a vehicle of Personal Digital Assistant 200 is detected (step 212;Y).

[0156] Moreover, although navigation equipment 100 acquired destination information [finishing / a setup] from the information centre in the explained 7th operation gestalt, the car current position is transmitted, an information centre 10 is searched for the transit path to the destination [finishing / a setup], and you may make it acquire the path and guidance data for which it looked from an information centre 10 (modification 72). In this case, all the transit paths to the car destination are sufficient as the transit path acquired navigation equipment 100, and you may make it acquire the division path according to the request from navigation equipment 100 as well as the 1st operation gestalt.

[0157] It is possible to constitute from a 7th operation gestalt explained above as follows.

(a) To mounted equipment [the information centre which can transmit specific data, and] [whether the Personal Digital Assistant is going to be carried in into the empty vehicle outside a vehicle, and] Or the thing which said Personal Digital Assistant is going to move into the empty vehicle outside a vehicle with a judgment means to judge whether the Personal Digital Assistant was carried in into the empty vehicle outside a vehicle, and this judgment means, When it is judged that the Personal Digital Assistant was carried in into the empty vehicle outside a vehicle,

or a transmitting means to transmit specific data from said information centre to said mounted equipment and said mounted equipment A store and a receiving means to receive the specific data transmitted by said transmitting means, and to store in said store. Car data processing system characterized by having a processing means to perform specific processing with said receiving means using the specific data stored in said store.

(b) Said judgment means is car data processing system given in (a) characterized by judging what said Personal Digital Assistant is going to move into the empty vehicle outside a vehicle when the distance of said Personal Digital Assistant and car becomes below a threshold.

(c) Said judgment means is car data processing system given in (a) characterized by judging that said Personal Digital Assistant was carried in into the empty vehicle outside a vehicle when said Personal Digital Assistant and said mounted equipment are connected by the cable for electric supply, or the cable for data transmission.

(d) It is car data processing system given in (a) characterized by for said specific data being guidance data for guiding a car to the destination, and said processing means guiding a car to the destination as said specific processing.

(e) It is car data processing system given in (a) characterized by having the road data storage which said specific data are destination data and stored the road data for routing, and equipping said processing means with a setting means to set up the path to the destination as said specific processing using road data and destination data, (b), (c), or (d).

[0158] (f) [a storage means and] [whether the Personal Digital Assistant is going to be carried in into the empty vehicle outside a vehicle, and] Or the thing which said Personal Digital Assistant is going to move into the empty vehicle outside a vehicle with a judgment means to judge whether the Personal Digital Assistant was carried in into the empty vehicle outside a vehicle, and this judgment means, Or a receiving means to receive specific data from said information centre, and to store in said storage means when it is judged that the Personal Digital Assistant was carried in into the empty vehicle outside a vehicle. The mounted data processor characterized by having a processing means to perform specific processing using the specific data stored in said store. As this mounted data processor, navigation equipment is used, for example.

(g) Said judgment means is a mounted data processor given in (f) characterized by judging what said Personal Digital Assistant is going to move into the empty vehicle outside a vehicle when the distance of said Personal Digital Assistant and car becomes below a threshold.

(h) Said judgment means is a mounted data processor given in (f) characterized by judging that said Personal Digital Assistant was carried in into the empty vehicle outside a vehicle when said Personal Digital Assistant is connected by the cable for electric supply, or the cable for data transmission.

(i) It is a mounted data processor given in (f) characterized by for said specific data being guidance data for guiding a car to the destination, and said processing means guiding a car to the destination as said specific processing, (g), or (h).

(j) It is a mounted data processor given in (f) characterized by having the road data storage which said specific data are destination data and stored the road data for routing, and equipping said processing means with a setting means to set up the path to the destination as said specific processing using road data and destination data, (g), (h), or (i).

[0159] In each operation gestalt and modification which were explained above, although ignition-on was made to perform destination setting check processing (drawing 9), switch-on of navigation equipment 100 may be made to perform destination setting check processing.

[0160] The navigation system of this invention is applicable also to the system which transmits and receives data with original communication networks, such as a taxi, a bus, a car for transportation, and a center that delivers them.

[0161] Although the case where the data of the destination etc. were transmitted was explained in each operation gestalt and modification which were explained when the destination was set as an information centre 10, an operator may be made to set the destination as the applicable user data 50 of an information centre 10 by conversation of the user of navigation equipment 100 or Personal Digital Assistant 200, and the operator of an information centre 10. Moreover, the destination or course ground transmitted to an information centre 10 from Personal Digital Assistant 200 may be the telephone number, 50 sounds of the address, a genre, a facility name, or a zip code. Moreover, the destination or the course ground may be transmitted to a center with voice, speech recognition of the transmitted voice may be carried out in the center, and a recognition result may be registered as the destination or a course ground.

[0162] Moreover, in each operation gestalt and modification which were explained, when a Personal Digital Assistant is connected with navigation equipment by the cable for data communication, in spite of being under communication link, it may separate by possibility that a user will remove the cable for data communication from a Personal Digital Assistant, or contact. So, when communicating through the cable for data communication, a means to prevent from removing the cable for data communication from a Personal Digital Assistant can also be established. For example, two pawls which engage with a Personal Digital Assistant, carry out elastic deformation when made to approach mutually in this condition of having been engaged by the user, and solve that engagement by inserting this connector itself in the socket of a Personal Digital Assistant to the connector of the cable for data communication are formed. And it has the cam of the ellipse form by which a roll control is carried out by the motor in the middle of two pawls. During data communication, the roll control of the motor is carried out so that it may not be made to approach also by actuation of a user by mutual, and the long side of the ellipse form of a cam may contact each pawl. On the other hand, in not being during data communication, the roll control of the motor is carried out so that

the shorter side of the ellipse of a cam may face each pawl, and it carries out as [be / contiguity actuation of the user to two pawls / possible]. Moreover, embed a light emitting device like LED at the connector of the telecommunication cable for data, when it is not during data communication, light is not made to emit, but on the other hand, when it is during data communication, a user may be told about being during data communication because flashing, lighting, etc. carry out this light emitting device. Moreover, you may make it change the foreground color in the case where it is not during data communication, and the case of being during data communication using the 2 color LED etc.

[0163] Although processing activation is possible even when these operation gestalt and a modification are independent respectively, although each operation gestalt and a modification were explained above, it is possible to add to to combine with other operation gestalten and a modification, other operation gestalten, and a modification, or to replace other operation gestalten and the applicable part of a modification.

[0164]

[Effect of the Invention] According to this invention, the acquisition acquisition of the specific data, such as a destination and a transit path, can be immediately carried out by ignition-on. Moreover, setting information, such as a destination to other navigation equipments, can be set up. Moreover, immediately after arriving at the car destination, the map data to the last destination or the last destination etc. are acquirable. Moreover, even if a car location is unknown, the map and transit path data to a car location are acquirable using a Personal Digital Assistant. Moreover, even if the point of arrival of a car is a communication link impossible point, it can notify the arrival location and having arrived to an information centre using a Personal Digital Assistant.

[Translation done.]